

2003

# Technology as a moderator of the role stressor-burnout relationship

Tu P. Lam

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**TECHNOLOGY AS A MODERATOR OF THE ROLE STRESSOR-BURNOUT  
RELATIONSHIP**

**A Thesis**

**Presented to**

**The Faculty of the Department of Psychology**

**San Jose State University**

**In Partial Fulfillment**

**of the Requirements for the Degree**

**Master of Science**

**by**

**Tu P. Lam**

**December 2003**

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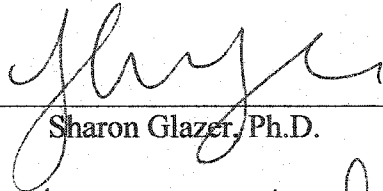
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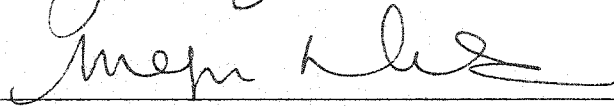
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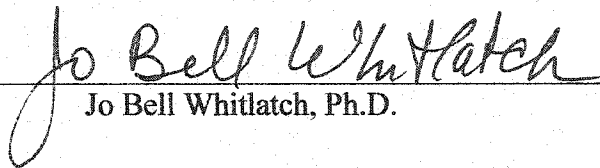
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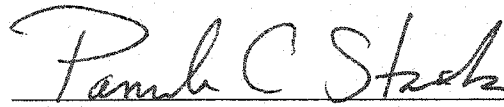
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## ABSTRACT

### TECHNOLOGY AS A MODERATOR OF THE ROLE STRESSOR-BURNOUT RELATIONSHIP

By Tu P. Lam

The present study examines the moderating effects of both technology appraisals and years of experience with technology on the relationship between role stressors (ambiguity, conflict, and overload) and burnout (emotional exhaustion, depersonalization, and diminished personal accomplishment). Self-report surveys were obtained from 213 librarians working in academic and public libraries. Results provide partial support for the hypotheses. Role ambiguity positively correlates with diminished personal accomplishment and role conflict is the only stressor to account for significant variance in total emotional exhaustion, burnout frequency, and total burnout. Technology appraisals moderates the relationship between role ambiguity and depersonalization, as well as between role ambiguity and overall burnout. Three-way interaction effects of technology appraisals, years of experience with technology, and both role conflict and role overload account for significant variance in four outcome variables, including emotional exhaustion, depersonalization, diminished personal accomplishment, and overall burnout. Finally, implications and future research are discussed.

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## Introduction

Schabracq and Cooper (2000) noted that rapid change and our ability to deal with changes are harmful for both the organization and employee. Technology appears to be changing faster than ever and workers are, consequently, expected to keep up to date with these changes. It would not be surprising if many stress-related illnesses were due to people's inability to effectively cope with the fast changes in technology. It is also not surprising that stress-related ailments can cost companies billions of dollars annually (Parker & DeCotiis, 1983; Robertson, Cooper, & Williams, 1990). In fact, the Bureau of Labor Statistics reported that employees who must leave work due to physical and mental strains on the job are away from their work for an average of 20 days (National Institute for Occupational Safety and Health [NIOSH], 2002). Individual consequences, due to working with technology include psychosomatic disorders (Fitter, 1987; Korunka, Weiss, Huemer, & Karetta, 1995; Zapf, 1995), increased blood pressure (Nelson & Kletke, 1990; Salvendy, 1982), heart disease (Frankenhaeuser & Gardell, 1976), and burnout (Salanova & Schaufeli, 2000). Other types of strains, that mostly affect the organization include absenteeism, turnover, and, subsequently, associated costs to these withdrawal behaviors (Kahn & Cooper, 1986).

As changes in technology continue to revolutionize job tasks, organizational structure, and organizational processes, people are continuously expected to adapt to these changes. Therefore, technological changes can introduce stress to the work environment. Fine (1986a) notes that change in technology can generate either positive or negative reactions in terms of acceptance or resistance to technology. Technology

advances augmented with resistance to change can contribute to the deterioration of the quality of work life and well-being of people (Nelson & Kletke, 1990).

It is argued that occupational stress is mainly due to constant changes in the work environment and computerization of work tasks (Carayon-Sainfort, 1990). According to Fitter (1987), new technology transforms manual skills into "intellectual" competence. Technology, therefore, can change job roles and tasks, and these changes may lead to increased role stressors and strains. Based on interview data and quantitative survey data from Danish nurses, Fitter's study revealed that fatigue and psychosomatic strains were related to work overload, difficult demands, and unpredictable technology.

Levi (1994) questioned the effectiveness of technology; do technological advances enhance quality of life and worker well-being? Numerous scholars (e.g., Bradley, 2000; Brod, 1982; Nebeker & Tatum, 1993; Sonnentag, 2000; and Symon, 2000) have suggested that more empirical studies are needed to provide a better understanding of the influence of technology on the quality of life and well-being of individuals. Most empirical studies on technology and stress have been conducted outside of the U.S.A., such as in Great Britain, Australia, Israel, Sweden (Nelson & Kletke, 1990), Austria, and West Germany (Kahn & Cooper, 1986). Therefore, the present study, done in the U.S.A., will add further insight to the technology and stress literature.

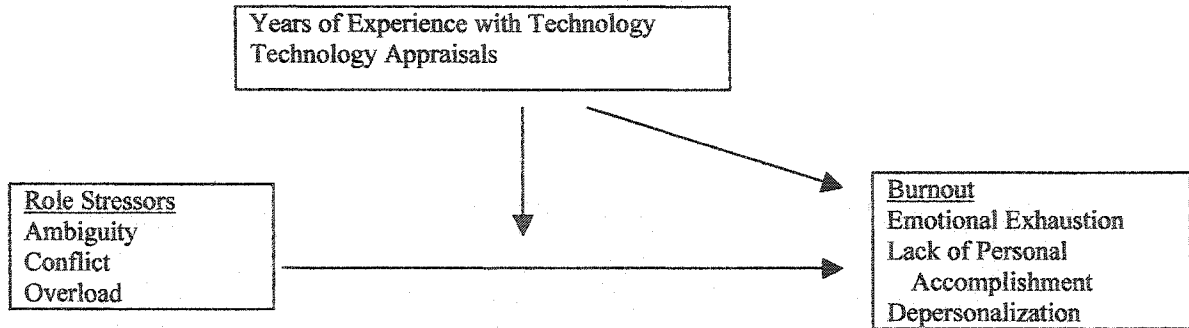
Psychological and behavioral strains to the individual, as well as negative organizational outcomes, are caused by work environment stressors that might stem from an individual's job, role, career, and organization (Kahn & Cooper, 1986). French,

Caplan, and Harrison (1982) note that work environment stressors are important to study because they are among the most salient correlates of mental and physical health.

Stressors are work environment conditions and demands that might require one to modify his or her behavior to the condition (Jex, Beehr, & Roberts, 1992). Research findings have shown that working with technology coupled with changing work structures and processes have impacted worker well-being (Agervold, 1987; Carayon-Sainfort, 1990; Korunka & Vitouch, 1999; Levi, 1994; Nelson & Kletke, 1990; Nelson & Teng, 2000; Salanova & Schaufeli, 2000; Salvendy, 1982). The purpose of this study is to examine the multidimensional variable, burnout, as a type of strain that stems from work environment stressors, including role stressors and technology.

Figure 1 depicts the general model of the stressors-burnout relationship. The aim of this study is to investigate the relationships between role stressors (ambiguity, conflict, and overload) and burnout (emotional exhaustion, depersonalization, and lack of personal accomplishment) as moderated by technology appraisals and years of experience with technology among Northern Californian librarians. This research will attempt to reveal how role stressors, technology appraisals, and years of experience with technology relate to burnout.





*Figure 1.* Model of the Relationships Between Role Stressors, Technology Appraisals, Years of Experience with Technology, and Burnout.

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### *The Influence of Technology*

It is expected that computer usage will increase at an accelerating rate because of its capabilities to store huge amounts of information. The personal computer (PC) held one bit of memory in 1965 (Salvendy, 1982), but is now able to accommodate over 128 megabits of memory, contingent upon the type of PC (Brain, 2002). In 1982, Dainoff reported that approximately seven million office employees in the United States were utilizing Visual Display Terminals (VDT) and VDT usage was expected to increase to 25 million by the year 1990 (Salvendy, 1982). A decade later, in 2000, Newburger (2000) reported that 50 million people in the U.S. were found to communicate through a vast array of digital technology, such as fax machines, modems, cellular telephones, and e-mail. In addition, Newburger noted that 54 million (51%) people possessed one or more computers in their household either for work or leisure activities.

New technology is redefining work and work systems for employees and

organizations (Majchrzak & Borys, 1998). First, information technology allows people to be connected at any time and anywhere (Parker & Wall, 1998). Second, technology fosters new forms of communication mainly through electronic mail systems (e-mails) and groupware applications. Technology also encourages employees to share knowledge, expertise, and company information. Lastly, remote connection gives new meaning to flexible work schedules, such that employees are given the option of working at home or outside of their office location.

Technology has seemingly allowed people to balance their personal and professional responsibilities, thereby, resulting in an assumed increase in individual well-being (Levi, 1994). Contrary to the assumption that technology enhances well-being, Kahn and Cooper (1991) and Carayon-Sainfort (1992) found negative associations between technology and strains. Kahn and Cooper found that coping with challenges that result from advances in information and technology positively correlated with anxiety. Furthermore, technology innovations and challenges, technological decisions, inadequate information, coping with huge amounts of information, technology breakdowns, and the inability to cope with new technology positively correlated with depression. Inadequate information sources (from working with computer systems) correlated negatively with job satisfaction. Carayon-Sainfort reported that more computer problems (e.g., breakdowns, slowdown, and inaccurate computer information) negatively affected perceived task characteristics (high workload, high work pressure, and low job control), which in turn increased worker stress (i.e., distress, dissatisfaction, daily life stress). In essence, task characteristics mediated the relationship between computer performance

and worker stress.

### *Burnout*

It was not until the early 1980s that burnout studies began to emerge. Burnout is a function of work environment experiences that results in a formation of psychological reactions towards the experiences (Jackson, 1984). Jackson further notes that burnout can be conceptualized as a multidimensional strain consisting of three dimensions, including emotional exhaustion, depersonalization, and low personal accomplishment. Emotional exhaustion transpires when individual characteristics and the work environment are not aligned. At this stage, the person is emotionally and physically taxed. Depersonalization emerges as a consequence of abrasive attitudes toward both the job and the people encountered on the job. Low personal accomplishment surfaces as a result of low or lost confidence to improve the situation and perform better on the job. Each component of burnout is assessed in terms of its frequency and intensity. Furthermore, each component of burnout can function as an individual strain reaction or one can look at the extent to which all components of burnout can contribute as a whole. However, Maslach (2000) suggests that burnout not be studied as a unidimensional construct, as many researchers have done before, because important information about the individual strain is lost. Table 1 presents a summary of 12 ways one can study burnout and its components.

A fourth and optional factor (Involvement) was not included in this study because this concept measures the extent to which the individual is connected with his or her clients (or, in the case of librarians, patrons). However, librarians in the present study

were expected to rotate from the reference desk to other library jobs that limited involvement with their patrons. In addition, Maslach and Jackson (1981) did not find empirical support for this construct and did not actually include it in the MBI. Thus, including the involvement scale did not appear appropriate.

Burnout, and its three components, appears to strike when there is too much work, no control over work, insufficient rewards, loss of community, perceived unfairness, and conflicting values (Maslach & Leiter, 1997). Researchers have reported that burnout is related to other strains, such as anxiety, muscle tension, chronic fatigue, headaches (Haack, 1984), gastrointestinal illness, high blood pressure, irritability, and sleep disruptions (Golembiewski & Munzenrider, 1988; Maslach & Leiter, 1997; Melamed, Ugarten, Shiram, Kahana, Lerman, & Froom, 1999). Research results on individual burnout components have yielded additional significant relationships with other variables. For example, emotional exhaustion was positively associated with alcohol abuse and alcohol dependence (Cunradi, Greiner, Ragland, & Fisher, 2003), as well as lower job performance (Wright & Bonett, 1997).

#### *Why Study Librarians?*

Technology and stress are terms that are well recognized and all too familiar to most librarians. More specifically, librarians must keep abreast of the constant changes and updates to their working methods due to technological changes in computer systems. The term technology and stress have been intertwined to address the psychological reactions to working with technology systems. *Technostress* is a "condition resulting from the inability of an individual or organization to adapt to the introduction and

operation of new technology” (Brod, 1982, p. 754). More specifically, it is “the physical discomfort of using terminals; changes in work patterns, routines and work flow that a computer forces upon them, compartmentalization and isolation, increased pace of work, and lack of adequate training and assistance in the use of computer software” (Raitt, 1987, p. 4). *Computerphobia* is the heightened anxious feeling regarding computers and *cyberphobia* is the fear of incapably learning the technology (Nelson & Kletke, 1990). Lastly, *technoism* is the dazed and confused feeling that results from technological developments and advancements (Crispo, 2002). Although many terms have been used to characterize various maladies resulting from technology and technology changes, our focus is primarily on technostress, that is, the strain resulting from use of and appraisal of technology.

Trying to keep up to date with technology changes can affect job responsibilities and duties of an individual, thereby producing psychological and physiological strains. Although library work was deemed the least stressful of all 250 careers listed in the Jobs Rated Almanac (Kniffel, 1999) and was rated as one of the 25 least stressful occupations (Poole & Denny, 2001), stressors that librarians experience might stem from technology changes. Nonetheless, empirical studies (Blazek & Parrish; 1992; Bunge, 1987; Elliott & Smith, 1984; Hickey, 1992; Parrish & Blazek; 1997; Roose, 1989) and literature reviews (Fisher, 1990) regarding librarians have noted that librarian work is indeed stressful and their work can cause burnout.

For example, traditional library card catalogs have become obsolete and in its place is a vast network of technological systems. Advances in technology have allowed

libraries to restructure work tasks, such that librarians now have numerous research tools available to them. Technology equipment comprising of the internet, fax machines, personal computer fax boards, photocopy machines, microcomputers (Walton, 1990), printers, microfilms, and CD-Roms (Bunge, 1991; Hickey, 1992) have made it possible for librarians to locate, access, share, and retrieve information from different library locations or network servers for library patrons. In fact, librarians must learn and *simultaneously* teach patrons to utilize these new technical research tools (Bunge, 1991) that are changing regularly.

Librarian tasks and duties can vary depending on the job responsibilities, type of library, and area of specialty. According to the *Encyclopedia of Careers and Vocational Guidance* (1997), the main duties of reference librarians are to provide service to the public through collection, organization, development of new methods for accessing information, and assisting patrons in locating information via on-line catalogs or in person. In addition, librarians may be required to attend conferences to purchase materials for their libraries and/or publish research papers for their library. Librarians must be constantly up to date with the technology in order to multi-task due to the changing nature of librarian job tasks and obligations. Therefore, use of the Internet and other forms of technology have introduced new stressors to the field of librarian work.

Few empirical studies have examined the relationship between role stressors and burnout in the library profession. Most published articles referring to librarians and burnout are opinion based rather than empirically founded (Blazek & Parrish; 1992; Parrish & Blazek; 1997). In fact, Blazek and Parrish conducted a content analysis of 49

articles to identify the number of burnout studies listed in both the Library Literature and the Library and Information Science Abstracts databases from January 1980 to December 1989. Not only did research findings show that most library research studies focused on job satisfaction, but burnout studies were heavily concentrated in professions such as nursing, teaching, and social work. Therefore, Blazek and Parrish recommended that future studies focus on the psychological well-being of librarians in addition to the type of library and type of activity that is required from them on a daily basis. In a subsequent study, Parrish and Blazek evaluated 106 articles in both the business periodicals and ABI Inform databases that dealt with the relationship between management and both organizational stress and burnout. Excessive workload, lack of communication, role ambiguity, role conflict, and management styles were contributing factors to burnout, though little is known about how these and other stressors relate to burnout among librarians.

In a literature review of librarian stress, one librarian reported that she was a victim of burnout because she felt that the demands of the job were emotionally and physically overwhelming. For example she felt under-appreciated, lacked job control, lacked challenging work, and experienced role conflict (Elliott & Smith, 1984). Based on interviews from 850 library staff, Bunge (1987) reported that library work was stressful for many librarians. Difficult patrons (41.4%), high workload (13%), and lack of supervisory direction (11%) were revealed as the greatest stressors across all libraries and job titles. In Bunge's study, public librarians stated that strain was mainly due to difficult patrons (41%), high workload (13%), and feelings of inadequacy (7%). It was apparent

that workload was a major factor that influenced strain among librarians. Bunge recommended examining the impact of workload on strain more closely. Workload can be both qualitative (i.e., requiring one to learn new skills) and quantitative (i.e., requiring one to take on more tasks than one has time to complete). It is possible that when librarians reported workload, they were referring to qualitative overload due to the need to constantly modify their knowledge of the computer software technology.

The main concern with implementing technology into librarian work tasks is that it can produce undesired reactions, mainly that of burnout. This study will attempt to provide a better understanding of the psychological effects of technology among reference desk librarians for several reasons: (1) there is lack of empirical research on this topic among librarians, (2) understanding the relationship between technology appraisals and burnout among librarians might aid management in developing appropriate training in dealing with both technology and burnout, and (3) these results might provide a better understanding of the use of the term 'technostress'. In order to reach these goals, surveys were distributed to librarians around the San Francisco Bay Area. Survey administration is recommended in examining the impact of technology on workers (Fine, 1986a) and technology and burnout among librarians because of the ability to reach a large sample and to acquire self-reported perceptions (Fisher, 1990).

### Literature Review and Hypotheses

#### *Role Stressors and Burnout*

Industrial and organizational psychologists and researchers often debate the meaning and function of stress. Jex et al. (1992) classified stress into three categories,



including stimulus, response, and stimulus-response interaction. A stimulus is a work environment trigger (i.e., job stressors) that requires the individual to adapt. Stress, when defined as a response, is the reaction to work environment stimuli (i.e., strain). A stimulus-response relationship is labeled as the effects of the work environment stimuli on individual responses. Selyé (1976) defined stress as any response to a demand, and, based on Jex et al.'s study, it is better labeled a strain. Schuler (1984) described stress as an important event that involves a higher degree of change and uncertainty. Schuler's use of the term stress would be more clearly described as a stressor. Parker and DeCotiis (1983) characterized stress as the awareness and feelings of "personal dysfunctions" created by the work environment. This refers to the relationship between stressors and strains. The present study uses the term stress in a generic manner to refer to an area of study that examines a stimulus-response relationship, as Jex et al. have recommended.

Research findings indicate that there is a direct relationship between role stressors (ambiguity, conflict, and overload) and mental and physical health (Cooper, Kirkcaldy, & Brown, 1994; Robertson et al., 1990). Jex (1998) defines a *role* as a set of behaviors in a specific position. He further defines *stressors* as job or organizational circumstances that may necessitate an adaptive reaction. Thus, role stressors are work-related demands, constraints, or opportunities that one perceives to be expected of him or her in order to fulfill his or her job role. Cooper (1983) notes that ambiguity and conflict are major contributors to strain. Ambiguity occurs when information is lacking in order to carry out specific tasks and/or unrealistic expectations (Beehr, 1976). Conflict exists when personal beliefs and values of the individual are not aligned with the job demands

(Abdel-Halim, 1978). Overload is present when resources are not available to successfully complete tasks (Sutherland & Cooper, 1988). Role stressors have been linked to anxiety and job dissatisfaction among managerial personnel of a heavy equipment manufacturing company (Abdel-Halim, 1978) and restaurant managers (Parker & DeCotiis, 1983). Moreover, role ambiguity, conflict, and overload have accounted for a significant amount of variance in burnout (Birch, Marchant, & Smith, 1986; Crane & Iwanicki, 1986; Gil-Monte, Valcarcel, & Zornoza, 1995; Misra & Sahu, 1993; Pierson-Hubeny & Archambault, 1987).

Most research studies on burnout are heavily concentrated within the medical profession. Among nurses, Gil-Monte et al. (1995) found positive correlations between role stressors (i.e., ambiguity and conflict) and strains (i.e., emotional exhaustion and depersonalization), and negative correlations between these role stressors and personal accomplishment. Based on a study of school psychologists, Pierson-Hubeny and Archambault (1987) found that role conflict predicted exhaustion and depersonalization, whereas role ambiguity only accounted for variance in personal accomplishment.

Similar relationships were found between stressors and burnout components among police officers (Kop, Euwema, & Schaufeli, 1999), teachers (Crane & Iwanicki, 1986; Misra & Sahu, 1993), social workers (Bhana & Haffejee, 1996), and workers at a manufacturing company (Zahrly & Tosi, 1988). For example, Misra and Sahu (1993) found positive correlations between role stressors and both emotional exhaustion and depersonalization, and a negative correlation with personal accomplishment. More specifically, Bhana and Haffejee (1996) linked ambiguity and conflict to both exhaustion

and accomplishment on both the frequency and intensity dimensions. Furthermore, Crane and Iwanicki (1986) revealed that both ambiguity and conflict accounted for significant variances on both the frequency and intensity burnout dimensions of emotional exhaustion, depersonalization, and lack of personal accomplishment with the exception that role conflict did not account for significant variance in lack of personal accomplishment. Burke and Greenglass (1993) found that role conflict was unrelated to burnout (measured as one construct) among 833 teaching and school administration positions, whereas Zahrly and Tosi (1998) reported that role conflict had a positive relationship with exhaustion among a sample of employees at a manufacturing company. Zahrly and Tosi also found that ambiguity did not add any predictive value in exhaustion at two different administrations of the survey to the same sample. These studies suggest inconsistent findings, though some stressors related positively with emotional exhaustion and depersonalization, but negatively with personal accomplishment. Inconsistent results may be due to differences in the various professions that were studied, such as police officers, teachers, social workers, and employees at a manufacturing company. Also, some studies examined burnout as a composite of the intensity and frequency of each of the three components, whereas others looked at various combinations of the intensity and frequency components of the three dimensions.

Evidence of role stressors impacting librarian burnout has been identified in two research studies (Birch et al., 1986 and Haack, 1984). Birch et al. conducted a study to examine both role ambiguity and role conflict in relation to burnout among 547 reference service public librarians across the U.S.A. They found that emotional exhaustion-

frequency, emotional exhaustion-intensity, lack of personal accomplishment-frequency, lack of personal accomplishment-intensity, depersonalization-intensity, and depersonalization-frequency regressed significantly on role ambiguity and role conflict, regardless of the order in which these role stressors were entered into the regression equations. In addition, both role stressors positively correlated with both the frequency and intensity scales of exhaustion and depersonalization, and negatively correlated with lack of personal accomplishment (frequency and intensity). Furthermore, both the frequency and intensity scales of exhaustion and depersonalization negatively correlated with age. Depersonalization (intensity) only negatively correlated with years at the library and lack of personal accomplishment. Birch et al. compared these findings with teachers and found that the relationship between both conflict and ambiguity with burnout were greater for librarians than teachers.

Haack (1984) administered the Staff Burnout Scale for Health Professionals (SBSPH) to librarians. The SBSPH scores revealed that burnout affected a large portion (42%) of the sample. More specifically, 28% of the sample reported ongoing psychological tension and 14% reported severe tension. High scorers on the SBSPH also reported feelings of fatigue, headaches, work pressures interfering with family life, lack of interest for clients and co-workers, sleeplessness, and trouble with organizational structure. Librarians perceived their work to be depressing, uncreative, and not stimulating. Not surprisingly, librarians in Haack's study have indicated that they are contemplating about finding new employment elsewhere.

Researchers have tested either all three role stressors or a combination of

ambiguity and conflict in relation to burnout. The above studies did not hypothesize that overload would contribute to higher levels of burnout, although overload was mentioned as one of the greatest demands on librarians in both the general literature for librarians and in my personal conversations with some librarians. Therefore, the first hypothesis will test the relationship of each role stressor with burnout and its various combinations. This study will also test if work overload is responsible for higher levels of burnout as cited in previous literature reviews (Blazek & Parrish, 1992; Parrish & Blazek, 1997) and studies (e.g., Bunge, 1987).

*Hypothesis 1a:* Role stressors will positively correlate with emotional exhaustion, depersonalization, and lack of personal accomplishment.

*Hypothesis 1b:* Role overload will account for the most variance among the three role stressors in emotional exhaustion, depersonalization, and lack of personal accomplishment.

#### *Technology Appraisals and Strain*

Resistance to change and to technology may result in financial losses for an institution. Employees may retaliate to the changes in technology by destroying technological systems and/or reducing their work performance (Fine, 1986a). Therefore, how one feels about technology is a critical factor in understanding the effects it has on the different types of strains. One theory that attempts to explain the resistance to technology can be attributed to the work of Aronsson (1989). Aronsson suggested that changing work tasks from manual skills to technical competence might change attitudes and feelings toward the job task itself. The new computerized task may become

monotonous and the lack of challenging tasks alters satisfaction levels. Although changes to computerized technology is not entirely new for librarians today, changes in software technology are regular. Role-related work stressors, opinions toward technology, and years of technology experience with technology are expected to influence burnout.

Zapf (1995) studied 259 South Germans at a software office and found that job stressors had a positive correlation with irritation and psychosomatic complaints, but an increase in computer workload was not directly related to strains (e.g., irritation and psychosomatic complaints). Role overload did not impact strains as expected and reported in most stress literature. Poole and Denny (2001) distributed 665 surveys to 28 Florida public community college libraries to measure attitudes of technological change in librarian work. Findings showed that most library personnel enjoyed (69.2%) and were excited (62.6%) about working with computers. Interestingly, technology exposure was not related to an increase in job stress (11.9%). However, the majority (63.5%) of employees reported that technology had increased their workload and responsibilities. Librarians who felt an increase in work tasks also reported feelings of frustration. Perhaps the increase in workload and responsibilities, and subsequent frustration, were the results not only of technology changes, but also of a decrease in the number of librarians that resulted from increased automation and its associated costs.

How individuals feel about specific technology systems (e.g., electronic data processing systems and telephones) have been examined in two studies (Korunka et al., 1995 and Von Emster & Harrison, 1998). Korunka et al. conducted a longitudinal study

that tested the effects of implementing new technology two months prior to implementation and 12 months after implementation. They found that employees who felt that their tasks were mundane and repetitive revealed more psychosomatic complaints and less satisfaction with their jobs than employees who had more challenging work and actually participated in the process of implementing technology. Furthermore, low employee participation during the implementation process also related to higher psychosomatic complaints and job dissatisfaction. Von Emster and Harrison measured attitudes toward telephones as a predictor of burnout among 46 customer service representatives. Their research provided evidence that role ambiguity related positively to pessimistic views toward telephones, thereby, generating a sense of low personal accomplishment, leading to high depersonalization and emotional exhaustion.

Few, if any, researchers have analyzed whether the interaction of role stressors and technology will account for an increase amount of variance in burnout. According to previous research findings, it is believed that how one appraises technology might affect the way stressors relate to strains. Researchers have found that there is a negative relationship between attitudes towards technology and irritation and psychosomatic distress (Zapf, 1995), frustration (Poole & Denny, 2001), burnout (Von Emster & Harrison, 1998), and both psychosomatic complaints and job dissatisfaction (Korunka et al., 1995). Although this model depicts a mediated analysis, it is likely that the relationship between role stressors and burnout will depend on how librarians appraise technology, such that technology appraisals might moderate the relationship between each role stressor and all components of burnout.

*Hypothesis 2:* Technology appraisals will moderate the relationships between each role stressor (ambiguity, conflict, overload) and burnout (see Figure 1). It is expected that the relationships between each role stressor and each burnout component will be more positive among librarians reporting low appraisals of technology than those reporting high appraisals of technology.

#### *Technology Appraisals, Years of Experience, and Strain*

Attitudes toward technology and technology experience are important factors to study because they will determine whether an individual will choose to accept or reject the technology. It is hypothesized that lack of technology experience and a pessimistic outlook on technology will increase burnout. Woodrow (1991) hypothesized that negative perceptions toward computers would harm one's creative ability and obstruct the process of learning. She administered a survey to students regarding opinions and feelings about technology and found that students with one semester of a computer class in comparison to no prior computer instructional courses had a more optimistic outlook toward computers and more willingness to enhance their knowledge in computers. Technology experience, in this case, played a critical role in the learning process.

Zoltan and Chapanis (1982) administered an attitudinal survey on beliefs and attitudes toward computers to 1,037 accountants, lawyers, pharmacists, and physicians in the Baltimore City area. Their results indicated that computer experience and positive attitudes positively correlated with one another. Professionals with little or no experience used more negative words to describe computers, such that computers were viewed as



“depersonalizing, impersonal, and costly” (p. 65). In a similar study, Levin and Gordon (1989) found that previous exposure to technology was linked to positive attitudes toward technology among 222 Israeli students.

Fitter (1987) noted that positive attitudes toward technology stem from direct experience with new technology. It is suggested that individuals exposed to computers either at work or at home have a more positive view about working with technology than those who have no or limited computer experience. Salanova and Schaufeli (2000) conducted a study on 202 Spanish workers employing computer-aided technology (CAT) and burnout. Results revealed that positive feelings regarding technology significantly correlated with exposure to technology (i.e., years using technology and how often one uses technology). As a result, higher goal attainment, more self-confidence (i.e., sense of personal accomplishment), and less cynicism (i.e., depersonalization) were reported. Their study showed that how one cognitively appraised the technology mediated the relationship between both frequent exposure to and duration of time using technology and burnout. Kerber (1983) also found that positive attitudes toward computer applications (quantitative software programs, decision-making, and record keeping) resulted in a favorable acceptance of technology among undergraduates. Kerber’s study also showed a positive correlation between years of experience with technology (e.g., more computer classes taken) and technology appraisals.

Aronsson (1989), Zapf (1995), and Poole and Denny (2001) have focused on the direct effects of working with technology and different types of strain. Thus, it appears that little or no published research have reported on the moderating effects of technology

appraisals on the relationships between stressors and strains, or more specifically, role stressors and burnout. Instead, Salanova and Schaufeli (2000) investigated the mediating effects of technology attitudes between exposure to technology and burnout. Hypothesis three will test a three-way interaction between years of experience with technology, technology appraisals, and each of the three role stressors, as well as seven two-way interactions of each of these variables, and their main effects on burnout.

*Hypothesis 3:* Technology experience and appraisals of technology will moderate the relationship between each role stressor (ambiguity, conflict, overload) and burnout (see Figure 1). In particular, the relationship between role stressors and the three components of burnout will be negative or flat with many years of experience and negative appraisals of technology, whereas for librarians with few years of experience and negative appraisals of technology, the relationship between stressors and burnout will be positive. Furthermore, many years of experience with technology and positive technology appraisals will buffer the relationship between role stressors and burnout, such that the relationship between role stressors and burnout would be fairly flat or negative. With few years of experience, but positive appraisals of technology, the relationship between role stressors and burnout will be positive.

## Methods

### *Participants*

Participants in this research study consisted of 213 librarians (79% public, 21% academic) in the San Francisco Bay Area, which constituted a 51% response rate out of 414 surveys distributed. Most of the respondents were women (79.1%). Ages ranged from 27 to 73 years ( $M = 49.31$ ,  $SD = 8.99$ ). Average tenure among academic and public librarians in their profession was 17 years and the number of patrons that each librarian assisted on a daily basis ranged from 0 to 250 ( $M = 40.53$ ,  $SD = 37.43$ ). Lastly, librarians had approximately 15 years of experience with technology ( $M = 14.99$ ,  $SD = 6.26$ ). Table 2 displays descriptive statistics of the demographic variables.

### *Measures*

*Role conflict, ambiguity, and overload* (See Appendix C Section I, A). A modified version of 15 items related to the three role stressors were taken from previous research studies (Abdel-Halim, 1978; Beehr, Walsh, & Taber, 1976; Rizzo, House, & Lirtzman, 1970). An example of a role overload item is "I receive an assignment without the manpower to complete it." An example of a role conflict item is "I have to do things that should be done differently." An example of a role ambiguity item is "I feel certain about how much authority I have." The response format was modified to a seven-point Likert-type scale, from 1-strongly disagree to 7-strongly agree. Item two of the role overload scale and all items pertaining to the role ambiguity scale (items 1-5) were reverse scored. Research studies have confirmed the validity and meaningfulness of these scales (Gonzalez-Roma & Lloret, 1998; House, Schuler, & Levanoni, 1983;

Kelloway & Barling, 1990). The alpha reliability coefficients were 0.86, 0.75, and 0.78 for role overload, role conflict, and role ambiguity, respectively. The mean scores for each of the three-five item scales were calculated using SPSS.

*Appraisals of technology* (See Appendix C Section II). Appraisals of technology consisted of three items. A one-item question, "How do you value your experiences with technological innovation in your job," was adopted from Salanova and Schaufeli (2000, p. 387). The new revised item was changed to "I value my experiences with technological innovation in my job." In addition, two items were added to ensure reliability. These items were "Technology has made my work tasks easier to perform" and "Technology has made positive contributions to my job." The response format was changed from a six-point format (1-very negative to 6-very positive) to a seven-point format (1-strongly disagree to 7-strongly agree) to unify the survey responses. The alpha reliability coefficient for this scale was 0.80. The mean score across these three items was calculated using SPSS.

*Maslach Burnout Inventory for Human Services (MBI-HS)* (See Appendix C Section III, A-C). A twenty-two-item scale, developed by Maslach and Jackson (1981), measured three dimensions (emotional exhaustion, personal accomplishment, and depersonalization) of burnout. An example of an emotional exhaustion item is "I feel emotionally drained from my work." An example of a personal accomplishment item is "I can easily understand how my patrons feel about things." An example of a depersonalization item is "I feel I treat some patrons as if they were impersonal objects." Each item was rated along two dimensions, frequency and intensity. The response format

for the frequency dimension ranged from 1-a few times a year to 6-every day. The response format for the intensity dimension ranged from 1-very mild, barely noticeable to 7-very strong, major. The original response formats for both dimensions were not altered in order to allow this research study to report findings in a manner consistent with other burnout studies. All items in the personal accomplishment subscale were reversed scored as suggested by Beehr (1995, p. 114) and Golembiewski and Munzenrider (1988, p. 19). This reversed construct will be referred to as a "lack of personal accomplishment."

Higher scores for each of these three burnout scales indicated more emotional exhaustion, lack of personal accomplishment, and depersonalization. Empirical studies have supported the reliability and validity of the MBI Inventory (e.g., Rafferty, Lemkau, Purdy, & Rudisill, 1986). The alpha coefficients for the frequency dimensions were 0.71, 0.81, and 0.79 for emotional exhaustion, personal accomplishment, and depersonalization, respectively. Alpha coefficients for the intensity dimension were 0.78, 0.87, 0.82 for emotional exhaustion, personal accomplishment, and depersonalization, respectively. In computing the subscale scores for burnout, Bhagat, Allie, and Ford (1991) noted that "the scores on the intensity and frequency dimensions for each of the burnout items should be multiplied and then added, thereby, leading to composite scores for the three subscales" (p. 169). Computations for the frequency and intensity dimensions were calculated by adding the total scores for each subscale on each dimension. Total burnout was computed by adding the composite scores for the frequency and intensity subscales.

*Procedures*

Four hundred and fourteen surveys were distributed to Northern California Bay Area librarians. A cover page on San Jose State University letterhead explained the purpose of the study, conditions, and contact information for myself, my thesis chair, and the Vice President of Graduate Studies and Research. A deadline of October 31, 2002 was conveyed on a flyer that was attached along with the survey instrument. One hundred and fifty six surveys with a pre-paid postage manila envelope addressed to my home were mailed to library managers and supervisors for distribution to 120 public and 36 academic librarians across five libraries. Upon completion of the survey, librarians were instructed to place it into the manila envelope, seal it, and mail it. The remaining 258 surveys were dropped at the participating library branches. Methods for collecting completed surveys in the remaining 16 public libraries and six academic libraries were discussed with each library contact person. The first of two options was to have each respondent place the survey in the manila envelope, seal it, and mail it back to the return address on the envelope. The second option requested that librarians place the survey instrument in the manila envelope, seal it, and return it to the office of the librarian supervisor or manager with the envelope addressed to the researcher's attention. Sealed envelopes were collected directly by myself at a designated drop-off location at the library. The time period for each pick up varied from one to four weeks, depending on the work schedules of the librarians. I also had an opportunity to informally speak with librarians during the distribution and collection of surveys. Our informal conversations added further qualitative insight to my research findings. These insights provide greater

contextual foundation for the results.

### *Analyses*

To test Hypothesis 1a, correlation analyses were performed between each of three role stressors (ambiguity, conflict, overload) and each of the 12 burnout facets (see Table 1). To test Hypothesis 1b, a hierarchical regression analysis was conducted.

Demographic variables (age, sex, employment status, and tenure), as well as the number of patrons served on a daily basis, were entered in step one. Years of experience with technology and technology appraisals were entered in step two. Finally, role stressors (ambiguity, conflict, and overload) were entered in step three using a stepwise procedure.

A hierarchical regression analysis was performed to test Hypothesis 2, that is, the moderated effects of technology appraisals on the relationship between each of the role stressors and 12 components of burnout. Demographic variables and number of patrons served were entered in step one. Role ambiguity, conflict, and overload were entered in step two. Technology appraisals was entered in step three. Lastly, the interaction between each role stressor and technology appraisals was entered in step four. The regression lines were calculated “using the values of the mean, one standard deviation above the mean, and one standard deviation below the mean” (Aiken & West, 1991, p. 13).

The moderating effects of technology appraisals and years of experience with technology on the relationships between each role stressor and each component of burnout (Hypothesis 3) were tested through hierarchical regression analyses.

Demographic variables were entered in step one. Each role stressor was entered in step

two. Years of experience with technology and technology appraisals were entered next, followed by six two-way interactions of each role stressor with years of experience with technology and each role stressor and technology appraisals. Then the two-way interaction of technology appraisals and years of experience with technology was entered. Lastly, each burnout facet was regressed on the three-way interaction among each role stressor, years of experience with technology, and technology appraisals. The values were calculated using one standard deviation above and below the mean at two levels (e.g., low and high) of the two other variables (Aiken & West, 1991, p. 52).

### Results

Data in this research study were analyzed using SPSS. Prior to testing the hypotheses, a series of factor analyses (see Tables 3-5) were performed to ensure that the survey items reflected the intended construct(s) being measured. First, a Principal Components Factor Analysis with a Varimax rotation was conducted to extract 10 factors for the 10 constructs (i.e., role ambiguity, role conflict, role overload, technology appraisals, and each of three frequency and each of three intensity burnout components) measured in this research. In this analysis, not all of the items loaded on the intended constructs. The 10 factors accounted for 59.7% in cumulative variance. Second, a Principal Components Factor Analysis with a forced four-extraction solution for items pertaining to role stressors (i.e., role ambiguity, role conflict, and role overload) and technology appraisals (see Table 3) were performed. Items pertaining to role stressors and technology appraisals loaded perfectly onto the intended constructs, all factor loadings were above .40. The four-factor extraction accounted for 61.7% of cumulative



variance. Third, two Principal Components Factor Analyses for frequency and intensity components of burnout were performed (see Tables 4 and 5, respectively). In constructing the Burnout Inventory, Maslach and Jackson (1981) reported that the frequency and intensity items moderately correlated with each other. Therefore, two separate factor analyses, for frequency and for intensity, with three extractions for each (pertaining to emotional exhaustion, depersonalization, and lack of personal accomplishment) were performed. Nearly all items loaded onto the appropriate subscales of the *frequency* dimension. The two exceptions were “Working with people directly puts too much stress on me” (See Appendix C Section III, A, item 8) and “I feel like I’m at the end of the rope” (See Appendix C Section III, A, item 9). Both items loaded onto the depersonalization subscale instead of the emotional exhaustion subscale. These results were similar to Golembiewski and Munzenrider’s (1988) factor structure. Item nine of the *exhaustion frequency-subscale* had a low factor loading (-.01) and was, therefore, eliminated from further calculations of the subscale scores and composite scores for the frequency, intensity, and burnout dimensions. The three-factor extraction for all frequency items contributed 44.7% in cumulative variance for frequency of burnout after removing item nine.

Almost all items loaded appropriately onto the *intensity* dimension, with the exceptions of “I feel like I’m at the end of the rope” (See Appendix C Section III, A, item 8) and item nine of the intensity emotional exhaustion-subscale. Item eight loaded onto the depersonalization subscale instead of the emotional exhaustion subscale. Item nine of the intensity emotional exhaustion-subscale was also removed from further computations

of the intensity subscale due to the low factor loading (.12). The intensity items accounted for 50.88% in cumulative variance for intense burnout after removing item nine.

The correlation table of the study variables is presented in Table 6.

Depersonalization (in terms of frequency, intensity, and both frequency and intensity combined) positively correlated with the number of patrons serviced. In essence, the more patrons the librarians helped, the less empathy they had, and the more they responded in a callous manner to their patrons. Furthermore, the combination of both frequency and intensity (i.e., total) of emotional exhaustion negatively correlated with role ambiguity. In other words, the more role ambiguity librarians felt, the less likely they were to report frequent emotional exhaustion. However, lack of personal accomplishment (frequency) positively correlated with role ambiguity. In essence, as role ambiguity increased so did feelings of frequent lack of personal accomplishments.

Hypothesis 1a stated that ambiguity, conflict, and overload would positively correlate with exhaustion, depersonalization, and lack of accomplishment. The relationship between each of three role stressors and burnout variations were examined. Partial support was obtained for hypothesis 1a such that role ambiguity was the only role stressor to positively correlate with frequent feelings of lack of personal accomplishment ( $r = .19, p \leq .01$ ). Unexpectedly, role ambiguity negatively correlated with total exhaustion ( $r = -.16, p < .05$ ). The analyses also showed that role conflict negatively correlated with frequent depersonalization ( $r = -.14, p < .05$ ), total depersonalization ( $r = -.17, p < .05$ ), total exhaustion ( $r = -.20, p \leq .01$ ), total burnout ( $r = -.25, p < .01$ ), and

burnout-frequency ( $r = -.18, p \leq .01$ ). Lastly, role overload negatively correlated with intense depersonalization ( $r = -.14, p < .05$ ), and total depersonalization ( $r = -.18, p \leq .01$ ).

### *Regression Analyses*

There were 12 possible ways of examining the three distinct facets of burnout (see Table 1). For purposes of clarification, combined frequency and intensity scores for each of the burnout components will be referred to as total exhaustion, total depersonalization, and total lack of accomplishment. In addition, composite scores for the frequency and intensity dimensions will be referred to as total frequency and total intensity. Pairwise deletions were performed for all analyses. Due to the large volume of data, only significant findings are reported in Tables 7 through 10 and Figures 2 through 21.

Hierarchical regression analyses revealed that role stressors, after controlling for demographics, number of patrons served, and after entering appraisals of technology together with years of experience using technology, accounted for a significant amount of variance in total exhaustion (3.1%), burnout-frequency (2.4%), and total burnout (3.8%). Further investigation showed that role conflict was the only role stressor with significant beta weights (see Table 7). Therefore, hypothesis 1b was not supported; of all the role stressors, role overload did not account for the most variance among role stressors in the burnout components.

Hypothesis 2 was partially supported such that technology appraisals moderated the relationship between role ambiguity and depersonalization (frequency, intensity, and total) and burnout (frequency, intensity, and total). In essence, the relationship between

role ambiguity and both depersonalization and burnout were positive for librarians disclosing negative perceptions of technology and somewhat negative and weak for librarians reporting positive appraisals of technology (see Figures 2-7). More specifically, the interaction between role ambiguity and technology appraisals added significant variance in depersonalization-frequency (3.1%), depersonalization-intensity (4.2%), depersonalization-total (3.8%), burnout-frequency (4.1%), burnout-intensity (3.8%), and total burnout (4.3%) (see Table 8).

Hypothesis 3 stated that years of experience with technology and technology appraisals would moderate the relationship between role stressors and burnout. It was expected that the relationship between role stressors and burnout would be negative or flat for librarians with many years of experience and negative appraisals of technology, but positive for librarians with few years of technology experience and negative appraisals of technology. Furthermore, it was expected that many years of experience with technology and positive appraisals of technology would buffer the relationship between role stressors and burnout such that the relationship between role stressors and burnout would be fairly flat or negative. With few years of experience using technology, but positive appraisals of it, the relationship between role stressors and burnout were expected to be positive. In essence, it was expected that years of experience with technology would guide the direction of the role stressor-burnout-relationship.

*Role conflict and burnout.* Hypothesis 3 was partially supported such that the three-way interaction among technology appraisals, years of experience with technology, and *role conflict* yielded significant variance in frequent exhaustion (accounting for 5.9%

of variance), total exhaustion (accounting for 2.6% of variance), frequent depersonalization (accounting for 3.8% of variance), total depersonalization (accounting for 6.5% in variance), total lack of accomplishment (accounting for 13.1% of variance), and total burnout (accounting for 10.4% of variance) (see Table 9). When librarians expressed negative feelings about technology, the relationship between role conflict and burnout decreased among librarians with more experience using technology, whereas the relationship between role conflict and the burnout dimensions were mostly flat for those with less years of experience with technology (see Figures 8a, 9a, 10a, 11a, 12a, 13a, 14a). Therefore, these results partially support Hypothesis 3. When technology was perceived positively, the relationship between role conflict and burnout dimensions decreased for individuals with less years of experience with technology, whereas the relationship between role conflict and burnout increased among individuals with more years of technology experience (see Figures 8b, 9b, 10b, 11b, 12b, 13b, 14b). As a result, this part of Hypothesis 3 was not supported.

*Role overload and burnout.* Technology appraisals and years of experience with technology also moderated the relationship between *role overload* and frequent exhaustion (accounting for 2.8% of variance), total exhaustion (accounting for 7% of variance), frequent depersonalization (accounting for 5.9% of variance), total depersonalization (accounting for 4.7% of variance), total lack of accomplishment (accounting for 3.9% of variance), total burnout (accounting for 3.6% of variance), and burnout frequency (accounting for 2.2% of variance) (see Table 10). When librarians expressed negative feelings about technology, the relationship between role overload and

burnout decreased for librarians with more years of technology experience, but was slightly positive for librarians with less years of experience with technology and negative feelings about technology (see Figures 15a, 16a, 17a, 18a, 19a, 20a, 21a). This part of Hypothesis 3 was supported. When technology was perceived positively, the relationship between role overload and burnout decreased for librarians with less years of technology experience, but increased among librarians with more years of experience with technology (see Figures 15b, 16b, 17b, 18b, 19b, 20b, 21b). This part of Hypothesis 3 was not supported.

#### Discussion

Technology has and will continue to revolutionize job roles and responsibilities of individuals, and in this case - librarians. Therefore, librarians must quickly learn to adapt to these constant changes in the work environment. New role expectations due to changes in job tasks created by technology advances have introduced different stressors into the librarian work environment. Librarians can either react negatively or positively to the technology. The main purpose of this research was to provide a better explanation of how role stressors and technology appraisals coupled with years of experience with technology would be related to burnout. This study focused on the relationship between role stressors (ambiguity, conflict, and overload) and burnout (emotional exhaustion, depersonalization, and lack of personal accomplishment), as moderated by technology appraisals and years of experience with technology.

This research study is unique as little theory clearly illustrated what type of burnout (e.g., frequency and/or intensity of the three burnout components) is related to

technology (appraisals and years of experience). Moreover, researchers have mostly found a direct relationship between role stressors and burnout, and few, if any, studied the moderating effects of technology on the role stressors-burnout relationships.

Although many researchers have examined the relationships of working with the technology and both frustration and anxiety, and most studies used correlational analyses to explain their results, the present study examines the multidimensional strain measure of burnout using hierarchical regression analysis.

Past researchers (Blazek & Parrish, 1992; Bunge, 1987; Elliott & Smith, 1984; Fitter, 1987; Parrish & Blazek, 1997; Zapf, 1995) and librarians (through personal interviews) have suggested that role overload contributes extensively to burnout. Results of the present research did not provide further support to this contention. Other stressors, such as role conflict and role ambiguity, had more of a relationship on burnout than role overload. For example, testing Hypothesis 1b revealed that role conflict was the only role stressor to have a significant beta weight that accounted for a significant amount of variance in total emotional exhaustion, burnout-frequency, and total burnout. Perhaps it was not the amount of work that librarians had, but the conflicting role expectations that produced burnout. This coincides with Edmonson and Thompson (2001) and Crane and Iwanicki (1986) who found direct associations between role conflict and emotional exhaustion on both the frequency and intensity dimension. In a study by Birch et al. (1986), role conflict accounted for significant change in variance in exhaustion (frequency and intensity), lack of accomplishment (frequency), and depersonalization (frequency and intensity). Role ambiguity, however, accounted for significant change in

variance in exhaustion (frequency and intensity), lack of personal accomplishment (frequency and intensity), and depersonalization (frequency). Role overload was not measured in Birch et al.'s study. Finally, the present study found that role conflict accounted for significant variance in various components of burnout, whereas Burke and Greenglass (1993) failed to link role conflict to burnout.

The implication of role conflict contributing significantly to total emotional exhaustion, burnout-frequency, and total burnout rather than role overload can be a function of several library-related issues. First, the role and responsibilities of librarians are constantly changing, thus altering their job description. The nature of the job duties varies such that librarians covering the reference desk can specialize in different areas (collection management and development, instructional services, technical services, and supervision and management) of library work. Based on personal conversations with some of the librarians, it was determined that many librarians worked outside of their library specialties in order to provide coverage for the reference desk. Consequently, librarians were unable to apply their expertise in their dominant area on a full-time basis. This could have possibly generated feelings of role conflict, but not role overload. Second, some librarians noted in the survey comments section that supervisors and managers did not include them in decisions regarding their work environment and work tasks. Librarians were expected to meet deadlines and to complete tasks without complaining. As noted by Maslach and Leiter (1997), burnout can emerge when there is lack of control in one's work. In addition, Parrish and Blazek (1997) linked different management styles to burnout. Third, organizational variables, such as lack of funding



for technical equipment and lack of resources could have possibly conflicted with personal beliefs and values. For example, one librarian mentioned that library politics prevented many librarians from performing to the best of their ability and this created a stressful environment for librarians. These feelings may have possibly resulted in reported perceptions of role conflict.

Although role ambiguity did not have a significant beta weight as expected in Hypothesis 1b, the results of this study suggest that role ambiguity positively correlated with frequent feelings of lack of personal accomplishment, thereby partially supporting Hypothesis 1a. Low personal accomplishment is present when individuals lose confidence in their ability to improve working situations and achieve personal goals. Perhaps the lack of clear direction stemming from technology changes is a function of librarians feeling “technostress,” as described by Raitt (1987). Lack of training in technology or lack of communication on how technology would change their roles may have contributed to feelings of lack of personal accomplishment in carrying out their work.

Little research or theory has examined the interaction between technology appraisals and role stressors on burnout. A negative relationship between attitudes toward telephones and depersonalization and emotional exhaustion among customer service representatives (Von Emster & Harrison, 1998), however, were reported. Findings in the present research provided partial support for Hypothesis 2 in relation to the 12 different ways of measuring burnout. Results revealed that the relationship between role ambiguity and both depersonalization (frequency, intensity, and total) and

burnout (frequency, intensity, and a total) were stronger for librarians who have a negative perception of technology than for librarians who appraise technology positively.

The results of this study are consistent with Korunka et al.'s hypothesis (1995) that attitudes toward electronic data processing (EDP) would be linked to greater strains (i.e., psychosomatic complaints and low job dissatisfaction). However, whereas Korunka et al. failed to obtain support for their hypothesis, the present study found empirical evidence that feelings about technology would be related to burnout. One possible explanation of the positive association between role ambiguity and burnout is that librarians who were apprehensive about technology were unclear about how technology would change role expectations in their work. As a result of role ambiguity, they experienced a form of "technostress" and a form of "cyberphobia" or the fear of being incapable of learning the technology.

Finally, partial support for Hypothesis 3 was obtained, such that both technology appraisals and years of experience with technology moderated the relationship between both role conflict and role overload and certain components of burnout. When librarians viewed technology as negative, the relationship between role conflict and burnout declined among individuals who had more years of experience with technology. It seems that many years of experience with technology helped to facilitate and manage feelings of emotional exhaustion, depersonalization, and lack of personal accomplishment rather than enhance or intensify these feelings because of negative appraisals of technology.

Unexpectedly, when librarians reported high regard for technology and had many

years of experience with it, the relationship between both role conflict and role overload on burnout were positive. This result supports the findings of Ballance and Rogers (1991), that is, students with more computer education endured more technostress than students with less computer instruction. Perhaps librarians who perceived technology as beneficial were trapped in conflicting expectations to perform well on the job despite the fact that they were required to learn the new technology in a short period of time.

Librarians who fell behind in learning the new technology had a tendency to be emotionally drained, experienced low accomplishment, and reacted negatively toward their peers and patrons. Another factor that may have impacted burnout is that new technology has automated tasks, which no longer require staff. Librarians, in libraries that are understaffed due to technology changes, are expected to take on more work, thereby, increasing and strengthening the relationship between stressors and burnout. Furthermore, greater burnout may be due to the underutilization of their technical skills. While librarians perceive technology as beneficial, their expertise in technology might be utilized to perform routine work, such as fixing technical equipment breakdowns, loading paper into the printers, teaching patrons to navigate on-line databases rather than challenging work. Therefore, burnout might arise as a function of the conflicting role expectations and increased workload. In fact, White (1998) notes that technology allows for repetitious administrative work and decreases in staff.

The relationship between both role conflict and role overload with burnout did not increase for librarians with few years of technology experience and low technology appraisals. This finding refutes others' findings (e.g., Fitter, 1987; Kerber, 1983; Levin

& Gordon, 1989; Salanova & Schaufeli, 2000; Woodrow, 1991; and Zoltan & Chapanis, 1982) that a pessimistic outlook concerning technology and less technology experience would relate to greater strain. These scholars, however, did not examine *role* stressors. *Role* stressors, in the present study, appear to play an important factor in evaluating the stressors-technology-burnout relationship. It appears that it is not the negative views about technology, but the positive perceptions of technology that strengthens the relationships between both role conflict and role overload with burnout, when librarians have many years of technology experience.

Librarians with high technology appraisals and less technology experience showed a decline in burnout. Perhaps librarians who are not technologically savvy, but believe in the benefits of technology are accepting of the technology changes in their work roles. As noted by researchers (e.g., Fine, 1986a and Nelson & Kletke, 1990), resistance to technology changes can produce detrimental effects on the individual. In this study, an optimistic outlook about technology may have assisted in dealing with the difficult demands of library work.

In Hypothesis 3, role ambiguity did not predict burnout when technology appraisals and years of experience with technology were accounted for. Zarhly and Tosi (1988) noted that ambiguity declined after acquiring knowledge of the role and understanding the expectations of the role, whereas role conflict emerged during the learning stage. While technology continues to change, librarians are constantly trying to keep up to date with technology. Perhaps librarians are aware of what is expected of them in their roles, but learning technology may continuously pose conflict and increase

workload because librarians are now attempting to learn the technology in a relatively short period of time, thereby, inducing burnout.

### *Limitations*

This study can only cautiously be generalized to the population of librarians for several reasons. First, reference desk librarians were recruited from Northern California and not all libraries participated in this study. Furthermore, participants were from academic libraries from the California State University system and one University of California library. Moreover, public librarians reported working at two or more libraries and each library work environment differed. For this reason, librarians might have evaluated their overall experience at both libraries. In addition, numerous librarians commented that after school hours and weekends were the most stressful times due to the increasing number of patrons. This survey was not an experiment, so stressors were assessed generically and not intended to assess one specific set of work hours.

In addition, a threat to the generalizability of this study is common method variance; the sequence in which this questionnaire was constructed may have influenced ratings for each subsequent scale. This self report study only used one method in collecting the data (i.e., paper and pencil survey), therefore, correlations between the variables may be inflated. Furthermore, this study was not longitudinal such that there was no baseline-intervention-observation assessment. Burnout may occur early rather than later in the librarians' careers or vice versa. Moreover, the duration of burnout may be short or long. Furthermore, the "technology" survey item asked librarians to consider a variety of technology machines such as computers, on-line fax machines, copiers,

telephones, software programs, and the Internet. The “term years of experience with technology” asked respondents to consider the number of years they have used technology and some have reported “all my life” which were eliminated from the analyses. Years of experience with technology did not take into account the degree to which a librarian is up-to-date-with technology. Therefore, these two variables should be more precisely operationalized. Lastly, causal inferences cannot be made, due to the cross-sectional nature of the survey administration in the present study.

#### *Future Research*

Fine (1986b) notes that librarians can reject technology changes in an aggressive or silent manner. In addition, Fine suggests that the technology changes may alter job tasks and “threaten the librarian’s self-perception and self-definition... and violate the personal values that specify the image of a librarian (p. 93).” In this present study, librarians reacted with callous feelings (e.g., depersonalization) towards their coworkers and patrons. Perhaps, librarians felt greater burnout because they believed that patrons were challenging their lack of technical skills, therefore, modifying the self-image (or sense of self-efficacy) of the librarian (Fine, 1986b). Based on these speculations, it is likely that training could play a vital role in determining worker performance and the type of strains workers will experience (Boner, 1987; Kahn & Cooper, 1986). It has been noted that supplemental education and training are associated with a greater sense of personal accomplishment (Manlove, 1993). Therefore, more attention and research should be focused on the impact of training in reducing or alleviating burnout.

It is critical that the skills and abilities of job incumbents are congruent with the

demands of the jobs in order to avoid different types of strains (Jex, 1998). Future research should explore task characteristics to determine if a relationship exists between technology variables and burnout, as this has been repeatedly conveyed in my personal conversations with librarians and in the survey comments section. More specifically, technology has been indirectly linked through job restructuring to psychosomatic illnesses (Amick & Celentano, 1991).

The factor that showed to influence the technology-strain relationship most was task characteristics (Agervold, 1987; Brass, 1985; Carayon-Sainfort, 1992; Moch, Bartunek, & Brass, 1979). Nelson and Kletke (1990) noted that work environment stimuli, in the context of technology, stem from the task itself. According to the Job Strain Model by Karasek (1979), and noted by several researchers (Korunka et al., 1995; Whitlatch, 1991), high strain is present when there is low job decision latitude and high demands. In fact, Kalimo and Leppanen (1985) reported that employees with advanced technological tasks were more satisfied with their work than those with less advanced tasks. Skill variety is crucial in determining a fit between the individual and environment (Jarvenpaa, 1997), especially that pertaining to job restructuring due to technology innovation. If skill variety is not met when implementing new technology and changing work tasks, then the person may experience mental under-stimulation. As a result, psychological and behavioral maladies (Frankenhaeuser & Gardell, 1976) may arise. Future research should, therefore, explore how job restructuring of job tasks to include technology will impact burnout.

In the additional comments section of the survey, many librarians reported that

stress was incurred from co-workers and managers, whereas other librarians noted that co-workers helped to reduce the effects of stress. Further investigation is needed to examine the role of social support in accordance with the role stressors-technology-strain relationship. Beehr (1995) suggests that the role of social support in organizations serves to weaken the relationship between stressors and strains. In fact, co-worker support has been shown to reduce high strain (Amick & Celentano, 1991) and lower depersonalization (Manlove, 1993).

Future studies might also consider longitudinal research regarding the impact of technology on burnout. Particularly interesting would be a study that measures stressors and strains before and after implementation of technology. Furthermore, burnout has been shown to appear early on in careers rather than in the latter part of an individual's career (Cherniss, 1992). Comparing librarians at different career stages might provide insight as to the effects of technology on other attitudinal outcomes (e.g., job satisfaction and organizational commitment).

It has been proposed that the three facets of burnout add unique value in interpreting total burnout (Gaines & Jermer, 1983; Gil-Monte & Peiro, 1998). Gaines and Jermer further asserted that emotional exhaustion is the first level of burnout and should be the intervention stage before lack of personal accomplishment and depersonalization develop. Gil-Monte and Peiro, however, take a different approach and theorize that low personal accomplishment is an antecedent to high emotional exhaustion and both low accomplishment and exhaustion are antecedents to depersonalization. In another research study, Von Emster and Harrison (1998) found that role ambiguity



positively correlated with emotional exhaustion and depersonalization and no association was found between role ambiguity and diminished personal accomplishment. These results demonstrate the importance for studying burnout in terms of each of its components and not a composite analysis in order to fully understand the stressors-technology-burnout relationship.

### *Conclusion*

Technology in stress research is a relatively new area of study that needs further attention because our work environments will continue to change to include new technology. Continual changes in technology can have detrimental effects on the physical and mental states of librarians. As new technology is adopted, job tasks and role expectations will change. This might cause one to react positively or negatively to technology changes. Technology appraisals coupled with role ambiguity, conflict, or overload explained a significant amount of variance in various components of burnout. Adding years of experience to the equation produced greater depth for understanding burnout among librarians with many or few years of experience with technology.

This research is unique; support was found between some stressor-technology appraisals-strain relationships. For example, it was suggested by Gil-Monte and Peiro (1998), and found in the present study, that role conflict was associated with emotional exhaustion and overall burnout, whereas role ambiguity was positively correlated with lack of personal accomplishment. Interestingly, inclusion of the technology appraisals in assessing the stressor-technology-strain relationship revealed that the relationship between role ambiguity and both depersonalization and overall burnout were stronger for

librarians with a positive perception of technology than for librarians with a negative appraisal of technology. Similarly, the interaction between technology appraisals, years of experience with technology, and either role conflict or role overload contributed uniquely to the variance in the different burnout components. More specifically, high technology appraisals and more years of experience with technology strengthened the positive relationship between role stressors and burnout.

This study tested the relationship among three role stressors, technology variables, and the 12 variations of burnout and found significant associations in some cases and no links in other cases. Findings were inconsistent with past research studies. It is recommended that future researchers analyze role stressors and components of burnout in order to provide a better understanding of how each stressor relates to burnout in conditions of positive and negative technology appraisals and few or many years of experience with technology.

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Table 1

*Explanation of Burnout and Its Components*

Burnout components	Explanation
1. Emotional Exhaustion (Frequency)	1. Total scores for emotional exhaustion on the frequency dimension.
2. Personal Accomplishment (Frequency)	2. Total scores for lack of personal accomplishment on the frequency dimension.
3. Depersonalization (Frequency)	3. Total scores for depersonalization on the frequency dimension.
4. Emotional Exhaustion (Intensity)	4. Total scores for emotional exhaustion on the intensity dimension.
5. Personal Accomplishment (Intensity)	5. Total scores for lack of personal accomplishment on the intensity dimension.
6. Depersonalization (Intensity)	6. Total scores for depersonalization on the intensity dimension.
7. Emotional Exhaustion (Total)	7. Total scores for emotional exhaustion on the frequency and intensity dimension.
8. Personal Accomplishment (Total)	8. Total scores for lack of personal accomplishment on the frequency and intensity dimension.
9. Depersonalization (Total)	9. Total scores for depersonalization on the frequency and intensity dimension.
10. Burnout (Frequency)	10. Total scores for all subscales (emotional exhaustion, personal accomplishment, and depersonalization) on the frequency dimension.
11. Burnout (Intensity)	11. Total scores for all subscales (emotional exhaustion, personal accomplishment, and depersonalization) on the intensity dimension.
12. Burnout (Total)	12. Total scores for all subscales (emotional exhaustion, personal accomplishment, and depersonalization) on the frequency and intensity dimension.

Table 2

*Demographic Statistics*

Measure and variable	N	Percentage
Sex	203	
Male	36	17.1
Female	167	79.1
Ethnicity	198	
East Asian-American	8	3.8
Southeast Asian-American	3	1.4
European American	160	75.8
Latin/Hispanic-American	14	6.6
Native-American Indian	1	.5
Pacific Islander	1	.5
Other	11	5.2
Marital status	204	
Single	48	22.7
Married/Re-married	114	54
Living with partner	17	8.1
Divorced/separated	19	9
Widowed/widower	6	2.8

Table 2 (continued).

Measure and variable	N	Percentage
Academic degree	205	
Bachelors	19	19
Masters	178	84.4
Doctorate	1	.5
Other	7	3.3
Job title	199	
Collection development	4	1.9
Reference services	144	68.2
Instructional services	9	4.3
Technical services	4	1.9
Library assistants/clerks	11	5.2
Supervisor/manager	24	11.4
Other	3	1.4
Employment status	205	
Full time	141	66.8
Part time	64	30.3
Type of library	211	
Academic	45	21.3
Public	166	78.7

Table 2 (continued).

Measure and variable	N	Percentage
CD-Rom usage	204	
No	108	51.2
Yes	96	45.5
Computer usage	204	
Yes	204	100
E-mail usage	204	
No	5	2.4
Yes	199	94.3
Fax usage	204	
No	35	16.6
Yes	169	96.7
Internet usage	204	
No	1	.5
Yes	203	96.2

Table 3

*Factor Analysis for Role Stressors and Technology Appraisals*

Items	RO	RA	RC	TA
It seems like I have too much work for one person to do.	.87			
On my present job, the amount of work seems to interfere with how well I can do the job.	.82			
I often notice a marked increase in my work load.	.81			
I receive an assignment without the manpower to complete it.	.77			
I am given enough time to do what is expected of me on my job.	.63			
I know exactly what is expected of me.		.83		
I have clear, planned goals and objectives for my job.		.79		
Explanation is clear of what has to be done.		.78		
I know I have divided my time properly.		.61		
I feel certain about how much authority I have.		.56		
I receive incompatible requests from two or more people.			.84	
I do things that are apt to be accepted by one person and not accepted by others.			.78	
I work with two or more group who operate quite differently.			.75	
I have to do things that should be done differently.			.52	



Table 3 (continued).

Items	RO	RA	RC	TA
I work on unnecessary things.			.44	
Technology has made positive contributions to my job.				.89
I value my experiences with technological innovation in my job.				.85
Technology has made my work tasks easier to perform.				.80

*Note.* RO = Role Overload, RA = Role Ambiguity, RC = Role Conflict, TA =

Technology Appraisals.

Table 4

*Burnout Inventory: Factor Analysis for the Frequency Component*

Items	D	PA	EE
I worry that this job is hardening me emotionally	.77		
I've become more callous toward people since I took this job	.73		
I don't really care what happens to some patrons	.71		
I feel like I'm at the end of my rope	.65		-.03
I feel I treat some patrons as if they were impersonal object	.63		
I feel patrons blame me for some of their problems	.55		
Working with people directly puts too much stress on me	.53		.34
I can easily create a relaxed atmosphere with my patrons		.72	
I feel energetic		.70	
I feel I'm positively influencing other people's lives through my work		.69	
I feel exhilarated after working closely with my patrons		.69	
I deal very effectively with the problems of my patrons		.68	
I have accomplished many worthwhile things in this job		.64	
In my work, I deal with emotional problems very calmly		.57	
I can easily understand how my patrons feel about things		.51	
I feel emotionally drained from my work			.73
I feel used up at the end of the workday			.70
I feel burned out from my work			.63
I feel frustrated by my job			.52

Table 4 (continued).

Factors	D	PA	EE
I feel fatigued when I get up in the morning and have to face another day on the job			.49
Working with people all day is really a strain for me			.48
I feel I'm working too hard on my job			.42

*Note.* D = depersonalization; PA = personal accomplishment; EE = emotional

exhaustion. Items with factor loadings less than 0.40 were deleted from the table.

Table 5

*Burnout Inventory: Factor analysis of the Intensity Component*

Items	PA	D	EE
I can easily create a relaxed atmosphere with my patrons	.78		
I deal very effectively with the problems of my patrons	.76		
I have accomplished many worthwhile things in this job	.75		
I feel exhilarated after working closely with my patrons	.75		
I feel I'm positively influencing other people's lives through my work	.74		
I feel very energetic	.69		
I can easily understand how my patrons feel about things	.65		
In my work, I deal with emotional problems very calmly	.62		
I worry that this job is hardening me emotionally		.80	
I don't really care what happens to some patrons		.79	
I've become more callous toward people since I took this job		.79	
I feel I treat some patrons as if they were impersonal objects		.65	
I feel like I'm at the end of my rope		.63	.12
I feel patrons blame me for some of their problems		.55	
Working with people directly puts too much stress on me		.51	.40
I feel used up at the end of the workday			.76
I feel emotionally drained from my work			.74
I feel I'm working too hard on my job			.62

Table 5 (continued).

Items	PA	D	EE
I feel frustrated by my job			.59
I feel burned out from my work			.57
Working with people all day is really a strain for me			.54
I feel fatigued when I get up in the morning and have to face another day on the job			.39

*Note.* D = depersonalization; PA = personal accomplishment; EE = emotional exhaustion. Items with an eigenvalue less than 0.40 were deleted from the table.

Table 6

*Descriptive Statistics and Correlations among the Study Variables*

Study Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Age	49.31	8.99	-									
2. Tenure	204.25	118.90	.62**	-								
3. Patrons	40.53	37.43	.15*	.03	-							
4. Tech. Years	14.99	6.26	.26**	.43**	.01	-						
5. Appraisals	5.77	1.01	-.05	.05	-.04	.14	-					
6. RA	3.15	1.10	-.09	-.06	-.12	-.04	-.16*	-				
7. RC	3.86	1.26	-.06	.13	-.20**	.05	.00	.38**	-			
8. RO	4.21	1.46	.14	.21**	-.10	.05	-.13	.26**	.39**	-		
9. EEF	3.35	1.21	.02	-.01	.15*	-.13	-.03	-.08	-.11	.08	-	
10. PAF	2.25	.83	-.16	-.05	-.14	-.10	-.24**	.19**	-.04	.01	-.02	-

Table 6 (continued).

Study Variables	Mean	SD	1	2	3	4	5	6	7	8	9	10
11. DF	4.04	1.93	-.01	-.11	.25**	-.02	.07	-.08	-.14*	-.13	.38**	-.06
12. EEI	4.40	1.31	-.03	-.08	.06	-.07	.03	-.06	-.07	.07	.82**	-.07
13. PAI	2.87	.97	-.04	.02	-.01	-.03	-.22**	.13	-.03	-.08	-.09	.74**
14. DI	4.96	2.15	.00	-.11	.22**	-.04	.07	-.04	-.14	-.14*	.36**	-.09
15. EE-total	147.12	89.91	.01	-.02	.16*	-.11	.09	-.16*	-.20**	-.01	.95**	-.10
16. PA-total	59.12	36.57	-.11	-.01	-.04	-.01	-.21**	.12	-.04	-.03	.04	.91**
17. D-total	132.45	92.19	-.01	-.12	.25**	.00	.09	-.10	-.17*	-.18*	.35**	-.11
18. Burnout	17.07	9.24	.01	-.14	.18*	-.01	.03	-.07	-.25**	-.10	.65**	.12
19. Frequency	3.12	.86	-.04	-.10	.17*	-.13	-.05	-.04	-.18**	-.03	.78**	.35**
20. Intensity	3.97	.92	-.03	-.10	.14	-.07	-.04	-.00	-.12	-.07	.63**	.22**

Table 6 (continued).

Study Variables	Mean	SD	11	12	13	14	15	16	17	18	19	20
11. DF	4.04	1.93	-									
12. EEI	4.40	1.31	.36**	-								
13. PAI	2.87	.97	-.10	-.15*	-							
14. DI	4.96	2.15	.89**	.42**	-.13	-						
15. EE-total	147.12	89.91	.47**	.92**	-.13	.48**	-					
16. PA-total	59.12	36.57	-.01	-.06	.86**	-.06	-.05	-				
17. D-total	132.45	92.19	.98**	.36**	-.14*	.94**	.46**	-.03	-			
18. Burnout	17.07	9.24	.68**	.70**	.01	.64**	.83**	.20**	.82**	-		
19. Frequency	3.12	.86	.74**	.64**	.12	.64**	.77**	.37**	.72**	.82**	-	
20. Intensity	3.97	.92	.63**	.76**	.27	.75**	.75**	.29**	.71**	.78**	.76**	-

Note. SD = Standard Deviation. Tech. = Technology. Appraisals = Technology Appraisals. RA = Role Ambiguity. RC =

Role Conflict. RO = Role Overload. EE = Emotional Exhaustion. PA = Personal Accomplishment. D = Depersonalization.

F = Frequency. I = Intensity. Total = Composite scores for each burnout subscale and the burnout subscales combined.

Frequency = Composite scores for all frequency subscale items. Intensity = Composite scores for all intensity subscale items.



Table 7

*Burnout Facets Regressed on Technology Appraisals, Years of Experience with Technology, and Role Stressors*

Variables	Strains					
	Total Exhaustion		Burnout Frequency		Total Burnout	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1		.039		.047		.060
Age	.001		.020		.118	
Sex	-.117		-.047		.006	
E. Status	.015		-.069		-.011	
Tenure	-.027		-.133		-.218	
Patrons	.175		.174*		.166*	.003
Step 2		.024		.010		
YOE	-.134		-.105		-.021	
Appraisals	.117		-.024		.055	
Step 3		.031*		.024*		.038**
RC	-.188*		-.165*		-.207**	
RA	-.082		.016		.031	
RO	.111		.052		.016	

*Note.* E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions; RC = Role Conflict, RA = Role Ambiguity, RO = Role Overload. \* $p < .05$ . \*\* $p < .01$ .

Table 8

*Burnout Facets Regressed on the Interaction Between Role Ambiguity and Technology**Appraisals*

Variables	Strains					
	Depersonalization Frequency		Depersonalization Intensity		Total Depersonalization	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1		.078*		.065*		.085**
Age	.052		.070		.039	
Sex	.036		-.005		.070	
E. Status	-.032		-.018		-.010	
Tenure	-.156		-.167		-.148	
Patrons	.237**		.213**		.243**	
Step 2		.004		.001		.005
RA	-.064		-.023		-.072	
Step 3		.005		.008		.009
Appraisals	.075		.093		.100	
Step 4		.031*		.042**		.038**
RA x Appraisals	-1.21*		-1.40**		-1.33**	

*Note.* E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions; Appraisals= Technology Appraisals; RA = Role Ambiguity; YOE = Years of Experience with Technology

\* $p < .05$ . \*\* $p < .01$ .

Table 8 (continued).

Variables	Strains					
	Burnout Frequency		Burnout Intensity		Total Burnout	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1		.047		.033		.060*
Age	.020		.034		.118	
Sex	-.047		-.044		.006	
E. Status	-.069		-.037		-.011	
Tenure	-.133		-.130		-.218*	
Patrons	.174*		.141		.166*	
Step 2		.001		.000		.003
RA	-.035		.002		-.053	
Step 3		.002		.001		.002
Appraisals	-.044		-.027		.045	
Step 4		.041**		.038**		.043**
RA x Appraisals	-1.38**		-1.33**		-1.41**	

*Note.* E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions; Appraisals= Technology Appraisals; RA = Role Ambiguity; YOE = Years of Experience with Technology

\* $p < .05$ . \*\* $p < .01$ .

Table 9

*Burnout Facets Regressed on the Interaction Between Role Conflict, Technology Appraisals, and Years of Experience with Technology*

Variables	Strains					
	Exhaustion Frequency		Total Exhaustion		Depersonalization Frequency	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1		.042		.039		.078*
Age	.050		.001		.052	
Sex	-.100		-.117		.036	
E. Status	-.097		.015		-.032	
Tenure	-.070		-.027		-.156	
Patrons	.151*		.175*		.237**	
Step 2		.010		.031*		.006
RC	-.106		-.188*		-.080	
Step 3		.020		.024		.007
YOE	-.159		-.139		.018	
Appraisals	-.002		.111		.079	
Step 4		.014		.009		.000
RC x YOE	-.546		-.442		.034	
RC x Appraisals	.082		.515		-.028	

Table 9 (continued).

Variables	Strains					
	Exhaustion Frequency		Total Exhaustion		Depersonalization Frequency	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 5		.010		.001		.000
Appraisals x YOE	-.760		-.182		.097	
Step 6		.059**		.026*		.038**
RC x YOE x Appraisals	10.80**		7.24*		8.70**	

*Note.* E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions; Appraisals= Technology Appraisals; RC = Role Conflict; YOE = Years of Experience with Technology

\* $p < .05$ . \*\* $p < .01$ .

Table 9 (continued).

Variables	Strains					
	Total Depersonalization		Total Accomplishment		Total Burnout	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1		.085**		.020		.060
Age	.039		-.178		.118	
Sex	.070		.030		.006	
E. Status	-.010		.030		-.011	
Tenure	-.148		.111		-.218*	
Patrons	.243**		.015		.166*	
Step 2		.011		.004		.038**
RC	-.110		-.067		-.208**	
Step 3		.013		.051*		.003
YOE	.048		.024		-.026	
Appraisals	.100		.230		.049	
Step 4		.000		.056**		.001
RC x YOE	.072		-1.11**		.075	
RC x Appraisals	-.104		1.32		-.267	

Table 9 (continued).

Variables	Strains					
	Total Depersonalization		Total Accomplishment		Total Burnout	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 5		.000		.014		.005
Appraisals x YOE	-.081		-.905		-.556	
Step 6		.065**		.131**		.104**
RC x YOE x Appraisals	11.40**		16.09**		14.38**	

*Note.* E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions; Appraisals= Technology Appraisals; RC = Role Conflict; YOE = Years of Experience with Technology

\* $p < .05$ . \*\* $p < .01$ .

Table 10

*Burnout Facets Regressed on the Interaction Between Role Overload, Technology Appraisals, and Years of*

*Experience with Technology*

Variables	Strains											
	Exhaustion Frequency			Total Exhaustion			Depersonalization Frequency			Total Depersonalization		
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1	.042		.039		.078*		.085**		.020			
Age	.050		.001		.052		.039		-.178			
Sex	-.100		-.117		.036		.070		.030			
E. Status	-.097		.015		-.032		-.010		.030			
Tenure	-.070		-.027		-.156		-.148		.111			
Patrons	.151*		.175*		.237**		.243**		-.015			
Step 2	.008		.000		.010		.021*		.000			



Table 10 (continued).

Variables	Strains												
	Exhaustion Frequency			Total Exhaustion			Depersonalization Frequency			Total Depersonalization			
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$	B	$\Delta R^2$	$\beta$	$\Delta R^2$	
Role Overload Step 3	.093		.021		-.106		-.153				-.022		.053*
YOE	-.151		-.133		.015		.043				.022		
Appraisals Step 4	.013		.121		.068		.083				-.236		.036
RO x YOE	-.021		-.015		.158		.410				.633		
RO x Appraisals Step 5	-.391		-.361		-.269		-.417				-1.29*		.052**
Appraisals x YOE	-1.10		-.756		.012		-.047				-1.77**		

Table 10 (continued).

Variables	Strains														
	Exhaustion			Total			Depersonalization			Total					
	Frequency	$\Delta R^2$	$\beta$	Exhaustion	$\Delta R^2$	$\beta$	Frequency	$\Delta R^2$	$\beta$	Depersonalization	$\Delta R^2$	$\beta$	Accomplishment	$\Delta R^2$	$\beta$
Step 6		.280**			.070**			.059**		.047**				.391**	
RO x	44.39**			22.23**			20.29**			18.22**				52.49**	
YOE x															
Appraisals															

Note. E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions;

Appraisals = Technology Appraisals; RO = Role Overload; YOE = Years of Experience with Technology

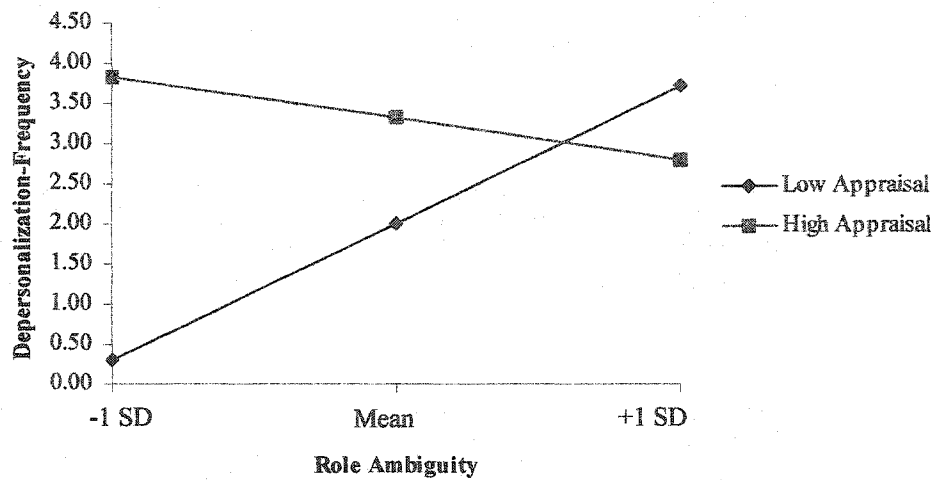
\* $p < .05$ . \*\* $p < .01$ .

Table 10 (continued).

Variables	Strains			
	Total Burnout		Burnout Frequency	
	$\beta$	$\Delta R^2$	$\beta$	$\Delta R^2$
Step 1		.060		.047
Age	.118		.020	
Sex	.006		-.047	
E. Status	-.011		-.069	
Tenure	-.218*		-.133	
Patrons	.166*		.174*	
Step 2 Role Overload	-.064	.044	.000	.000
Step 3		.002		.010
YOE	-.024		-.106	
Appraisals	.047		-.026	
Step 4		.004		.008
RO x YOE	.023		.279	
RO x Appraisals	-.404		-.617	
Step 5 Appraisals x YOE	-.644	.007	-.850	.012
Step 6 RO x YOE x Appraisals	15.88**	.036**	39.15**	.218**

*Note.* E. Status = Employment Status; Total = composite scores for frequency, intensity, and burnout subscales or dimensions; Appraisals= Technology Appraisals; RO = Role Overload; YOE = Years of Experience with Technology.

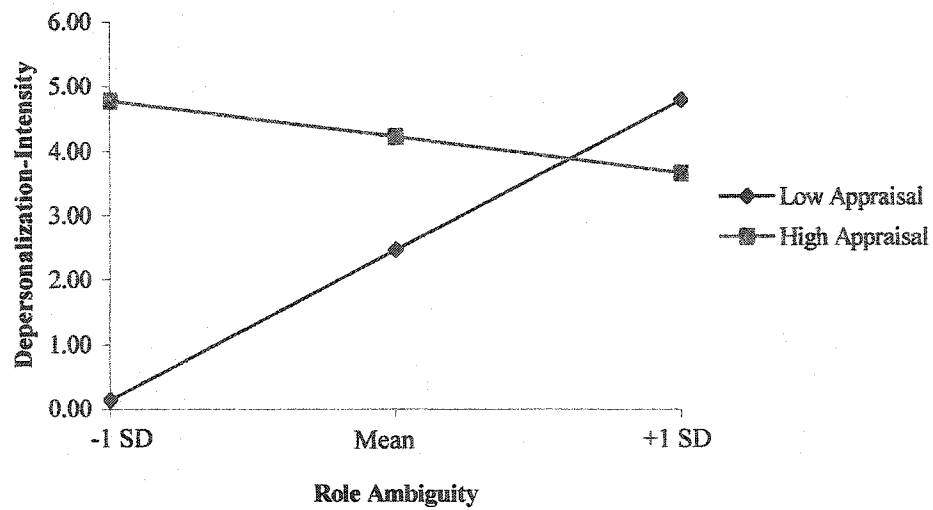
\* $p < .05$ . \*\* $p < .01$



*Figure 2.* Two-way Interaction Between Role Ambiguity and Technology Appraisals on Depersonalization-Frequency.

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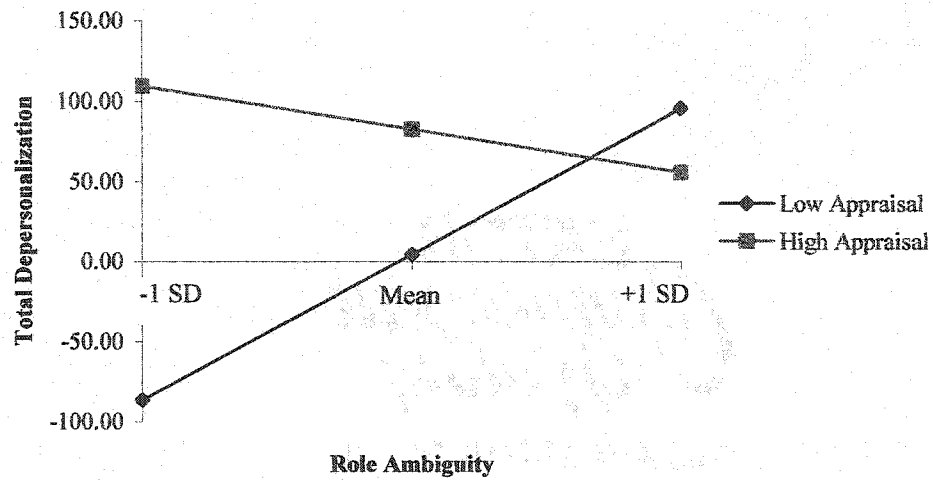
*Note.* The two-way interaction between role ambiguity and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 3.* Two-way Interaction Between Role Ambiguity and Technology Appraisals on Depersonalization-Intensity.

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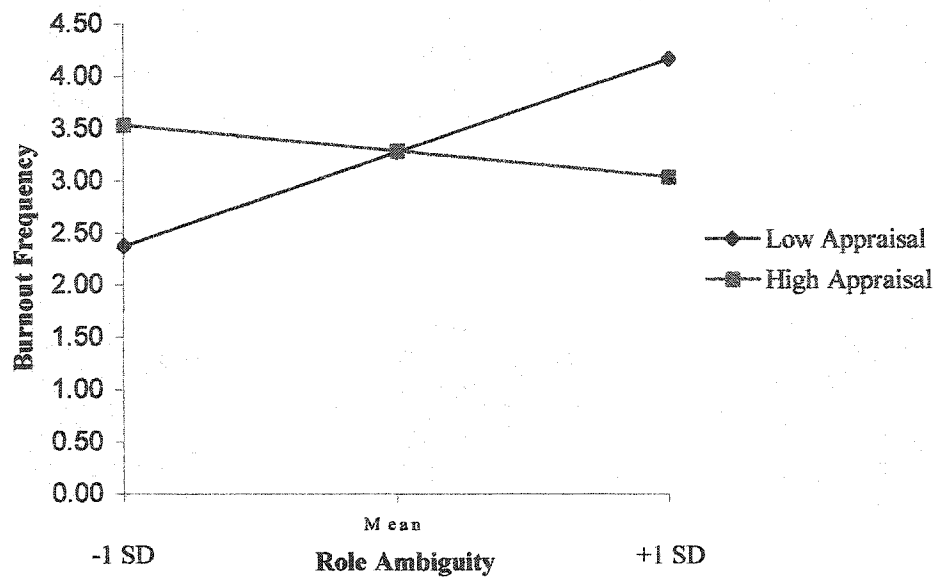
*Note.* The two-way interaction between role ambiguity and the technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 4.* Two-way Interaction Between Role Ambiguity and Technology Appraisals on Total Depersonalization.

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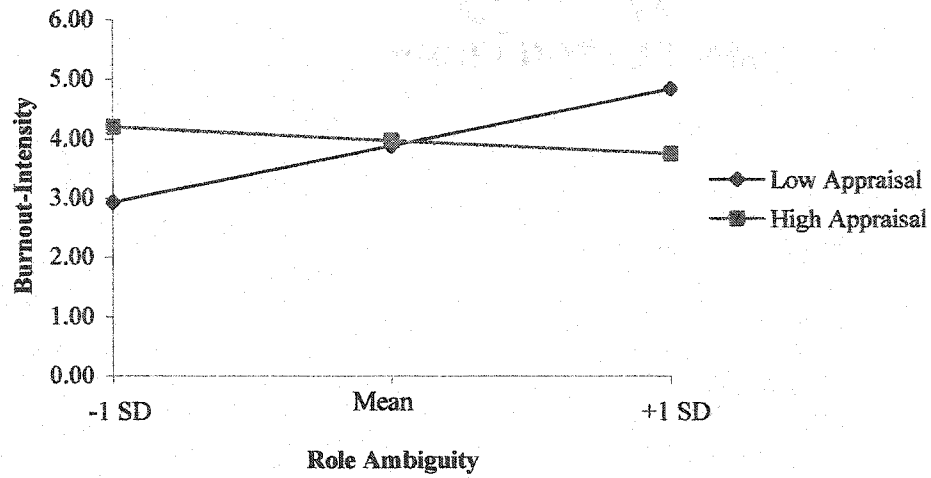
*Note.* The two-way interaction between role ambiguity and the technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 5.* Two-way Interaction Between Role Ambiguity and Technology Appraisals on Burnout-Frequency.

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*Note.* The two-way interaction between role ambiguity and the technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

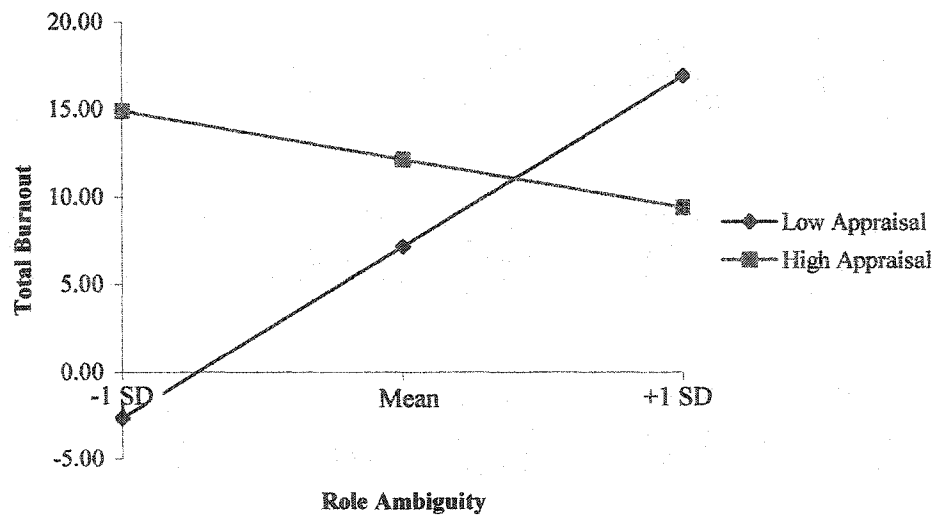


*Figure 6.* Two-way Interaction Between Role Ambiguity and Technology Appraisals on Burnout-Intensity.

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*Note.* The two-way interaction between role ambiguity and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

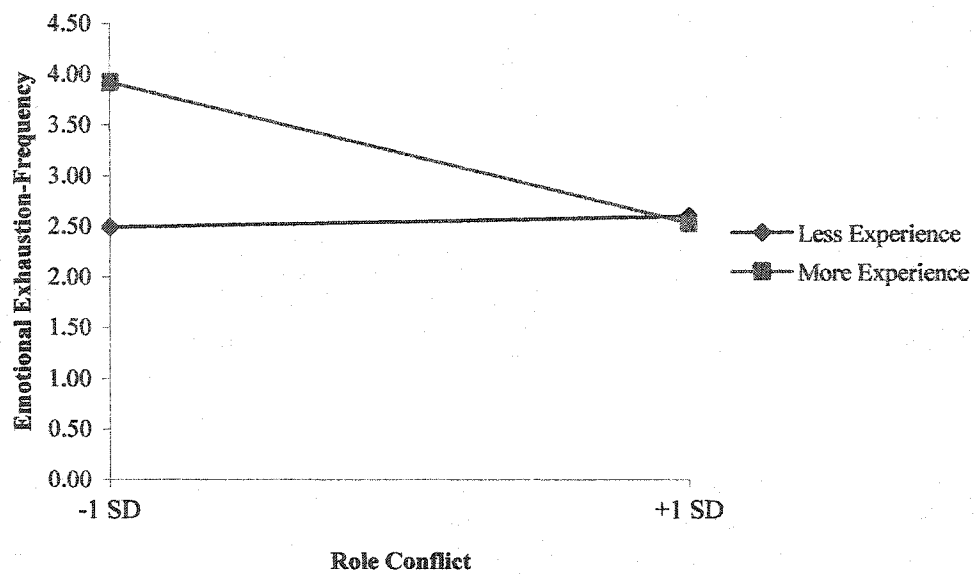




*Figure 7.* Two-way Interaction Between Role Ambiguity and Technology Appraisals on Total Burnout.

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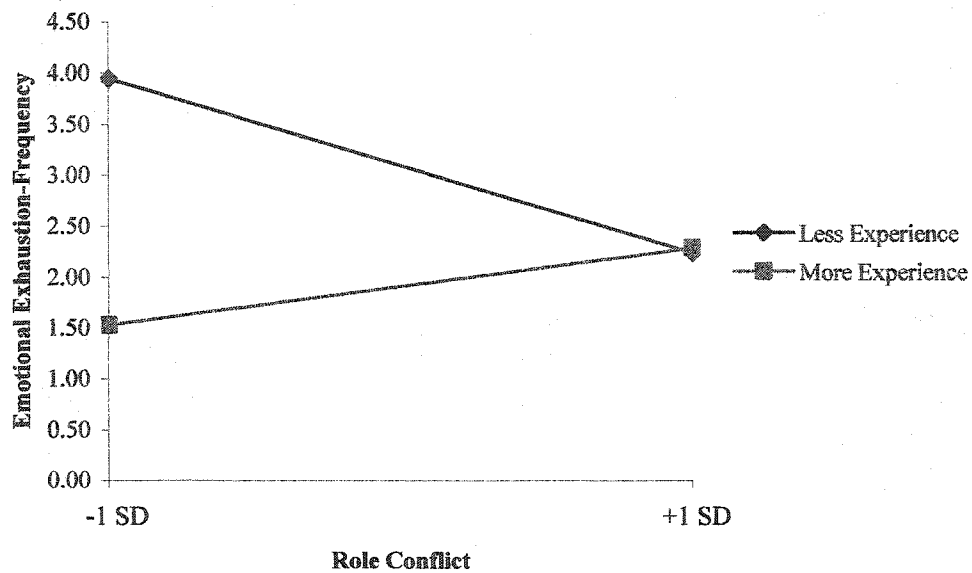
*Note.* The two-way interaction between role ambiguity and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 8a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Emotional Exhaustion-Frequency.

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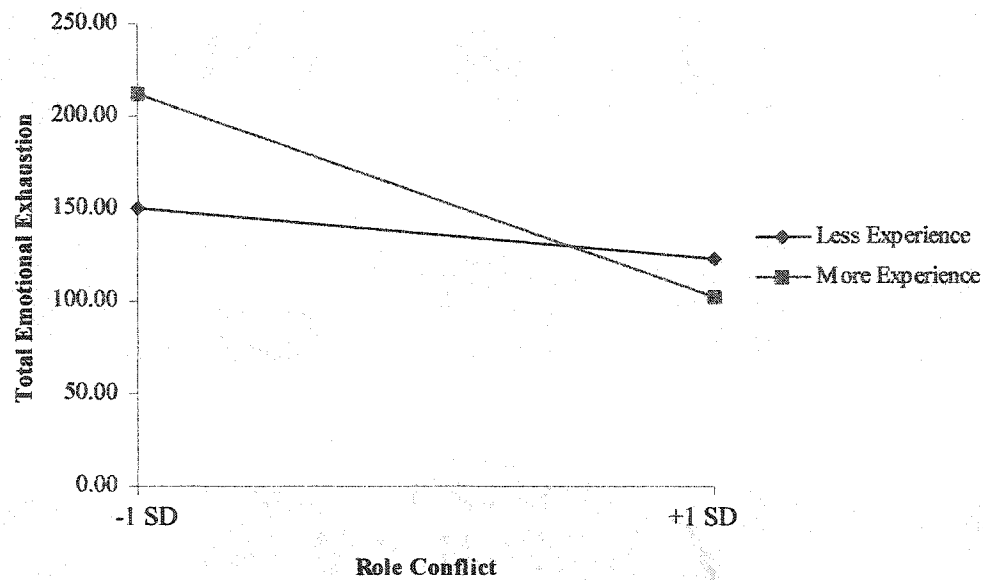
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 8b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Emotional Exhaustion-Frequency.

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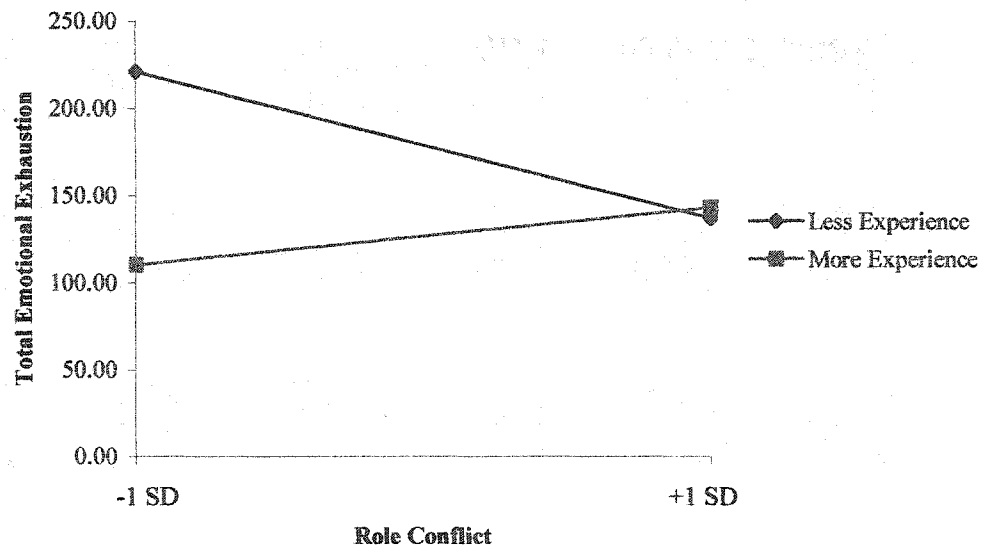
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 9a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Total Emotional Exhaustion.

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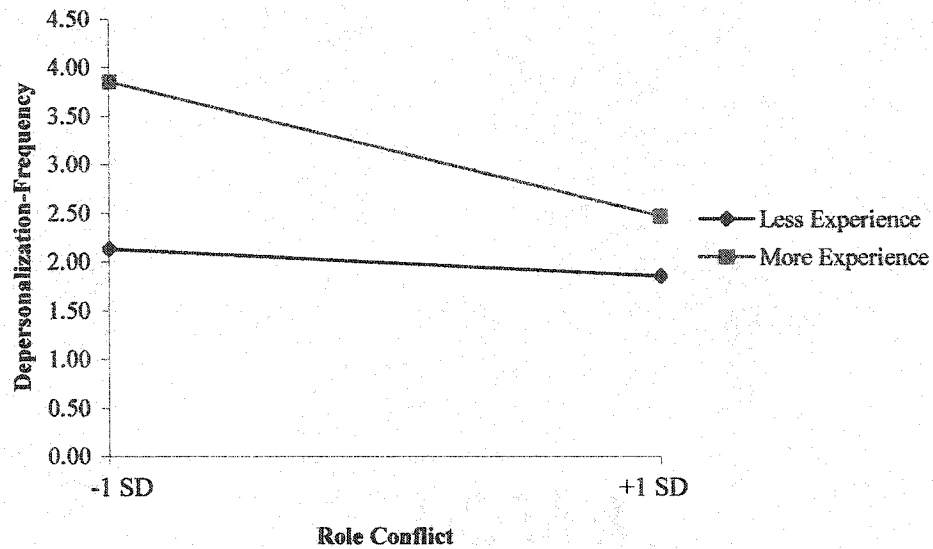
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 9b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Total Emotional Exhaustion.

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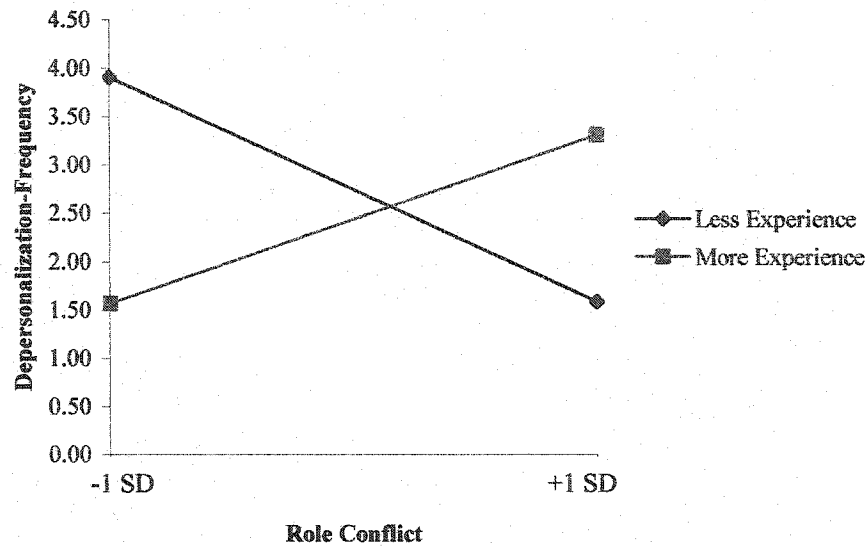
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 10a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Depersonalization-Frequency.

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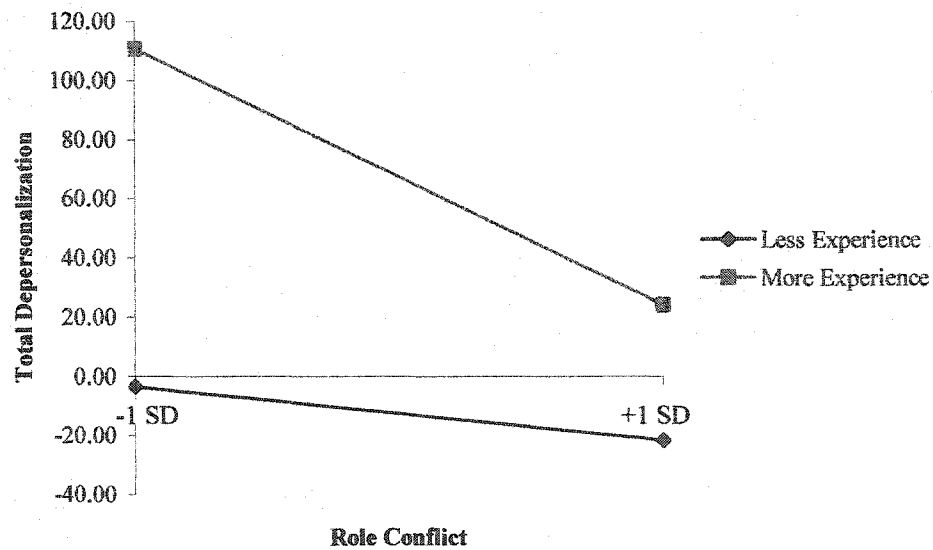
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 10b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Depersonalization-Frequency.

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*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

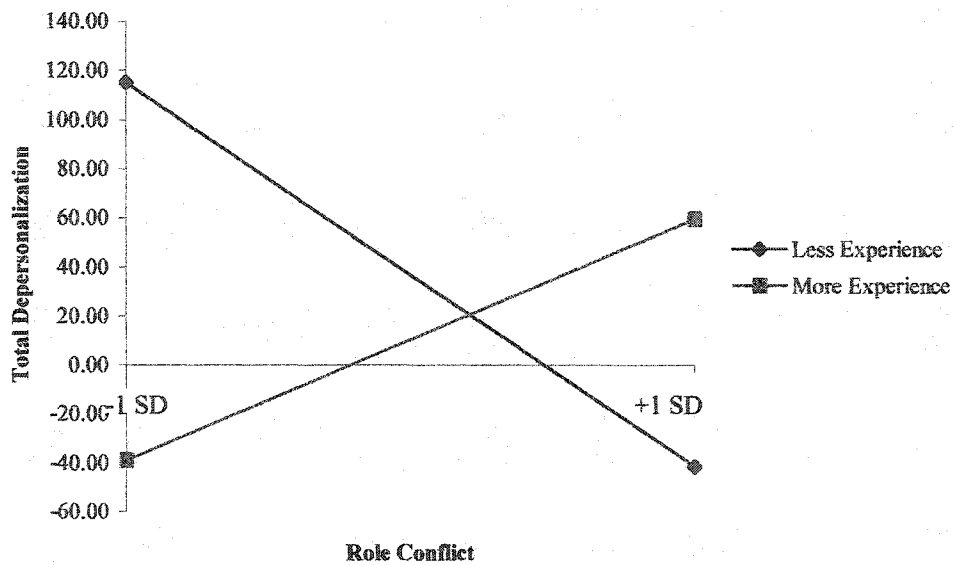


*Figure 11a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Total Depersonalization.

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*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

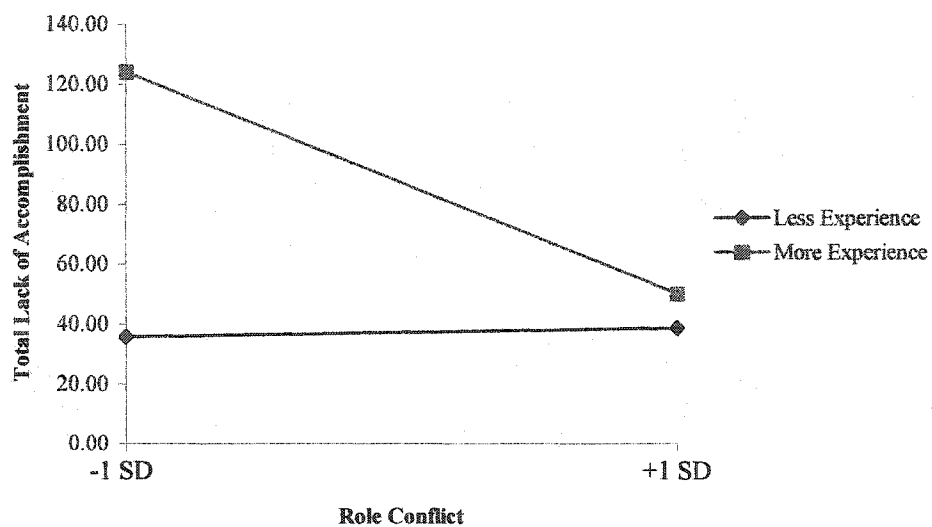




*Figure 11b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Total Depersonalization.

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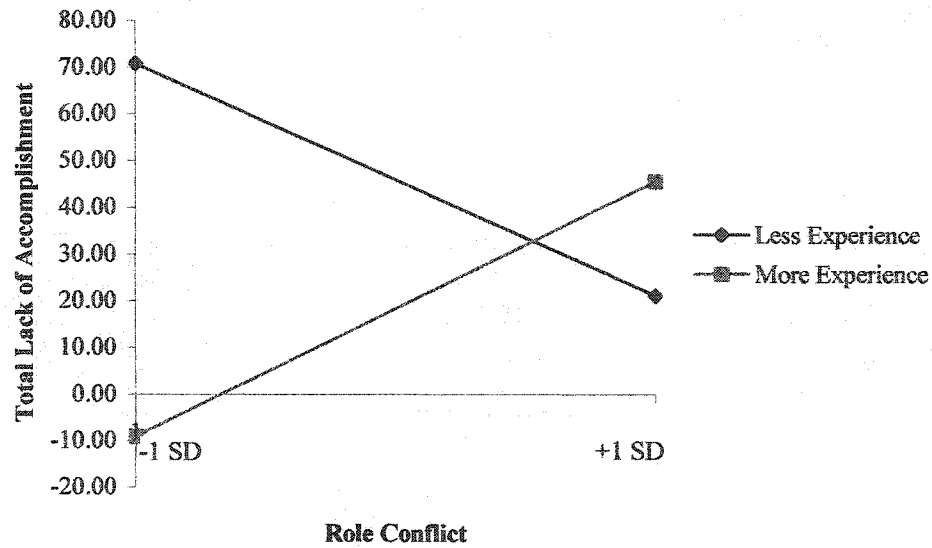
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 12a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Total Lack of Accomplishment.

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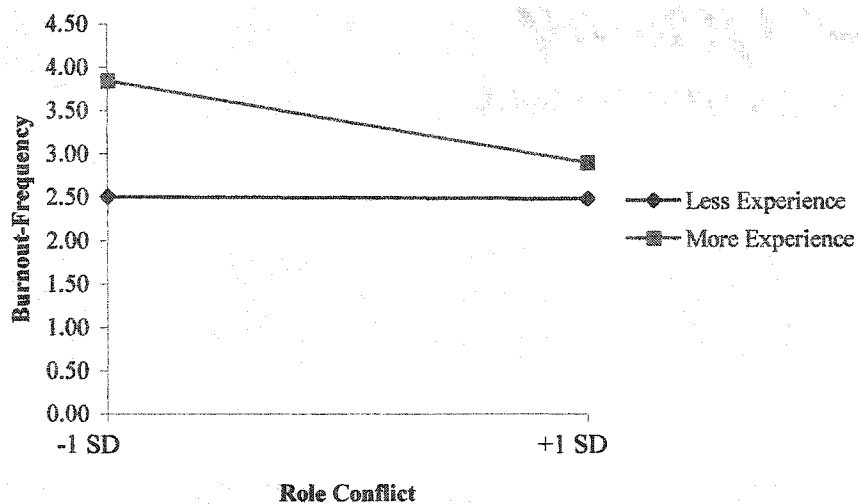
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 12b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Total Lack of Accomplishment.

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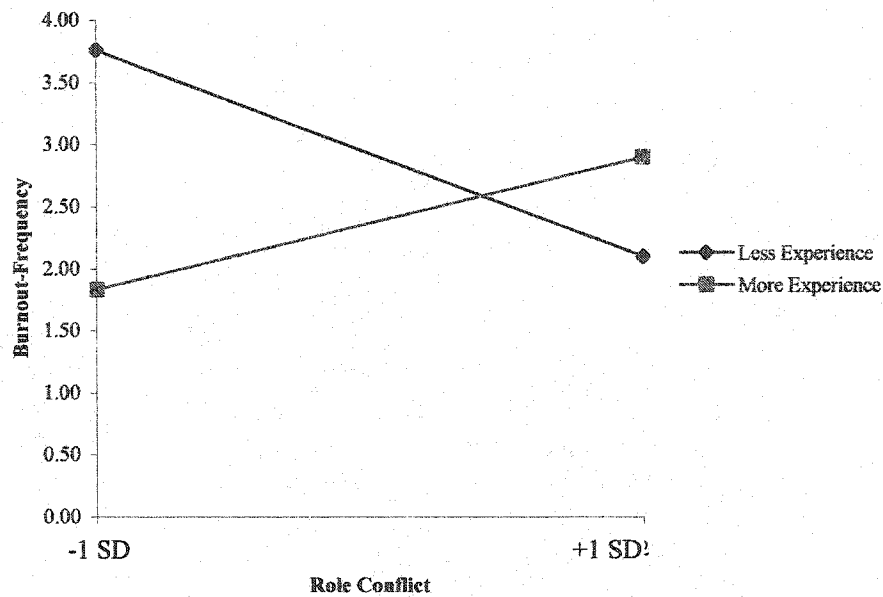
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 13a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Burnout-Frequency.

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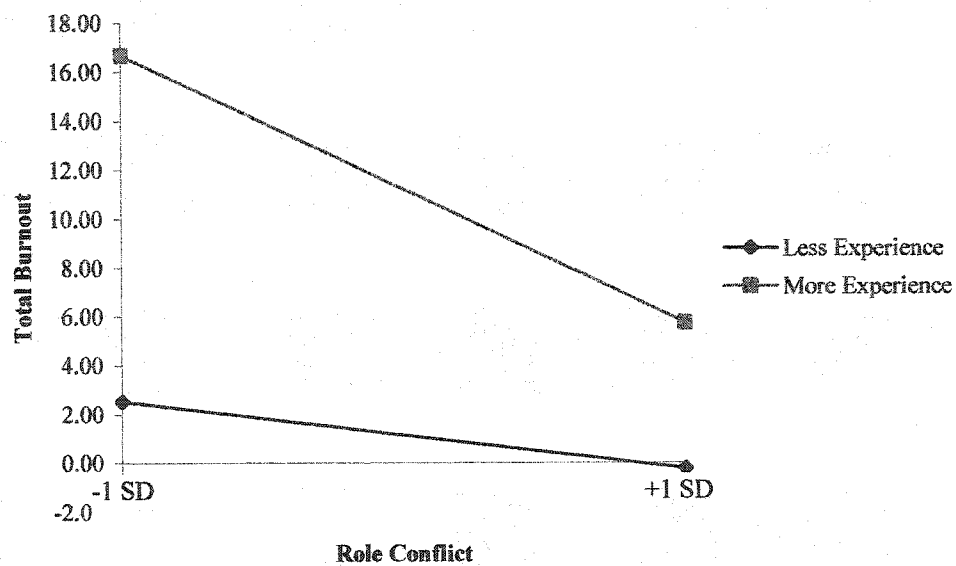
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 13b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Burnout-Frequency.

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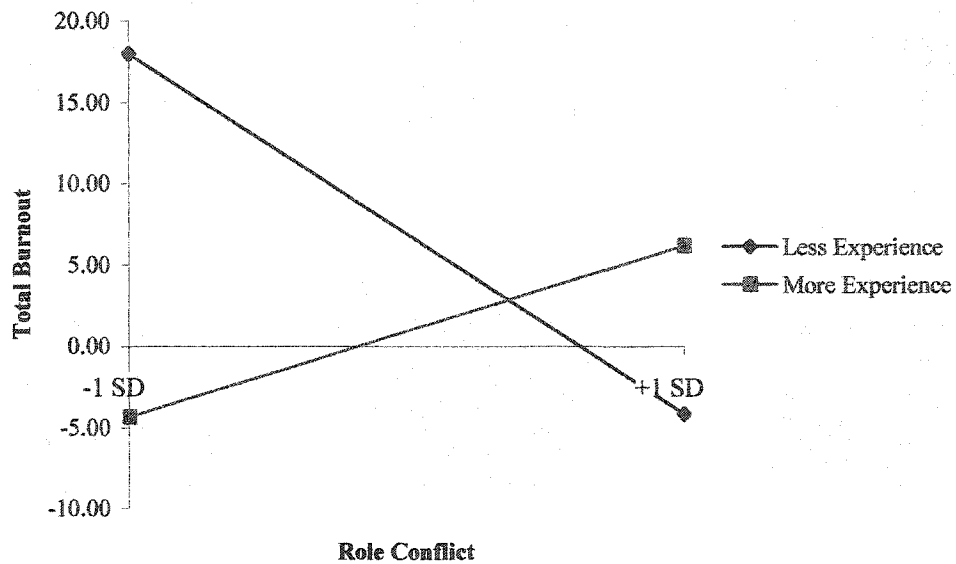
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 14a.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is Low* on Total Burnout.

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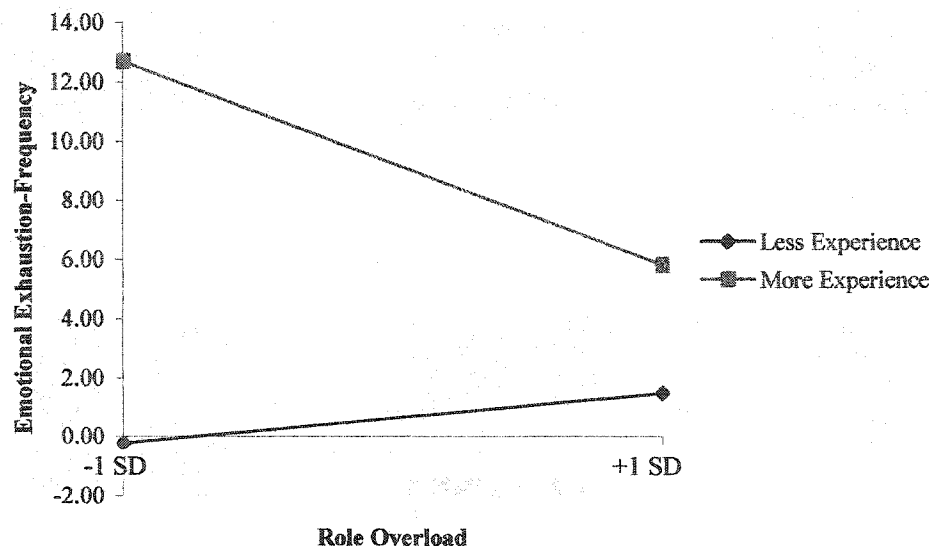
*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 14b.* Three-way Interaction Between Role Conflict and Years of Technology Experience when *Technology Appraisals is High* on Total Burnout.

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*Note.* The three-way interaction among role conflict, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

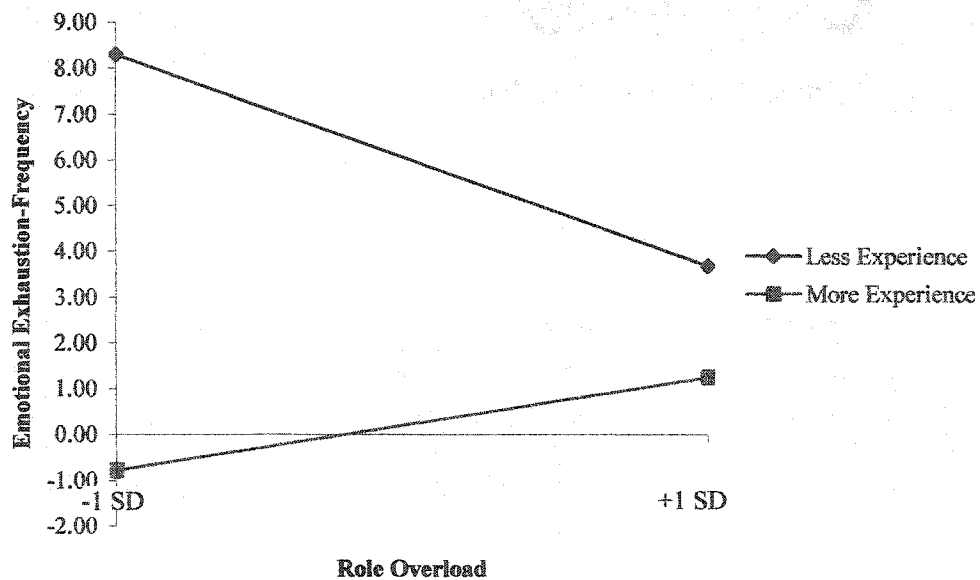


*Figure 15a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Emotional Exhaustion-Frequency.

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*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

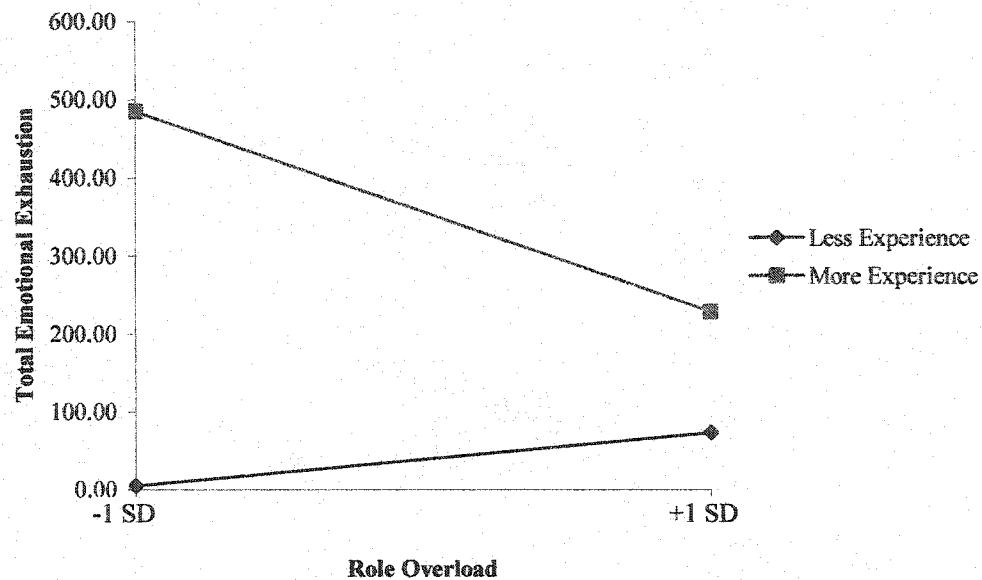




*Figure 15b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Emotional Exhaustion-Frequency.

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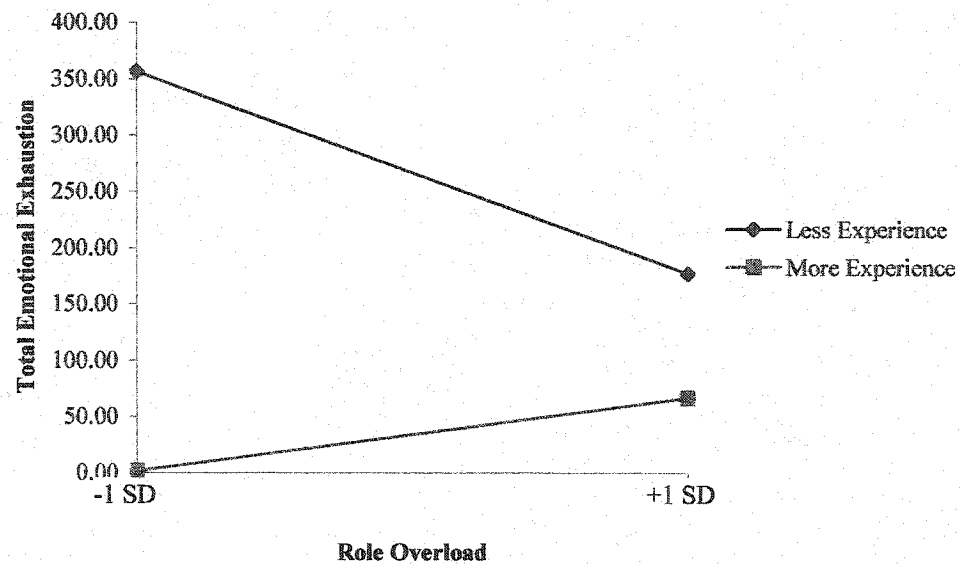
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 16a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Total Emotional Exhaustion.

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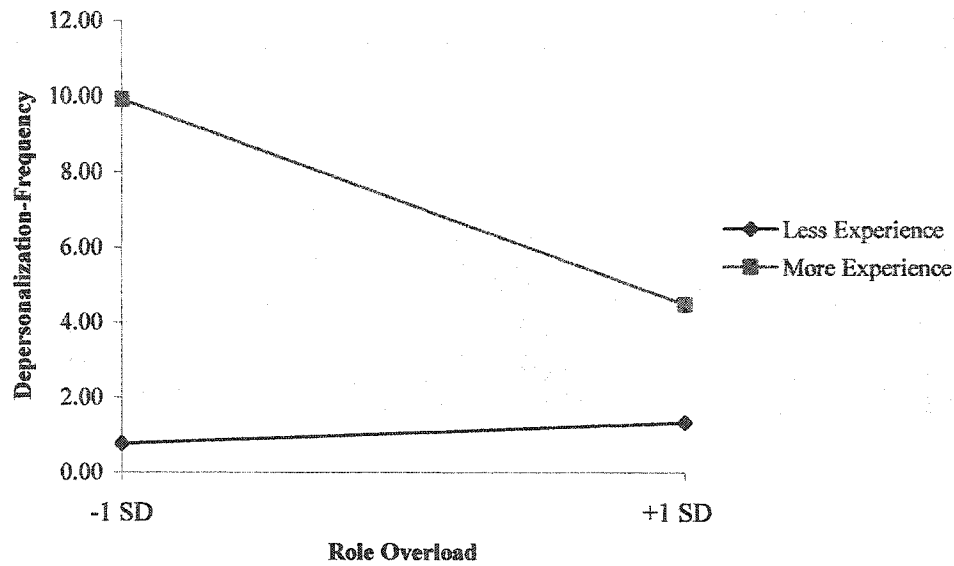
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 16b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Total Emotional Exhaustion.

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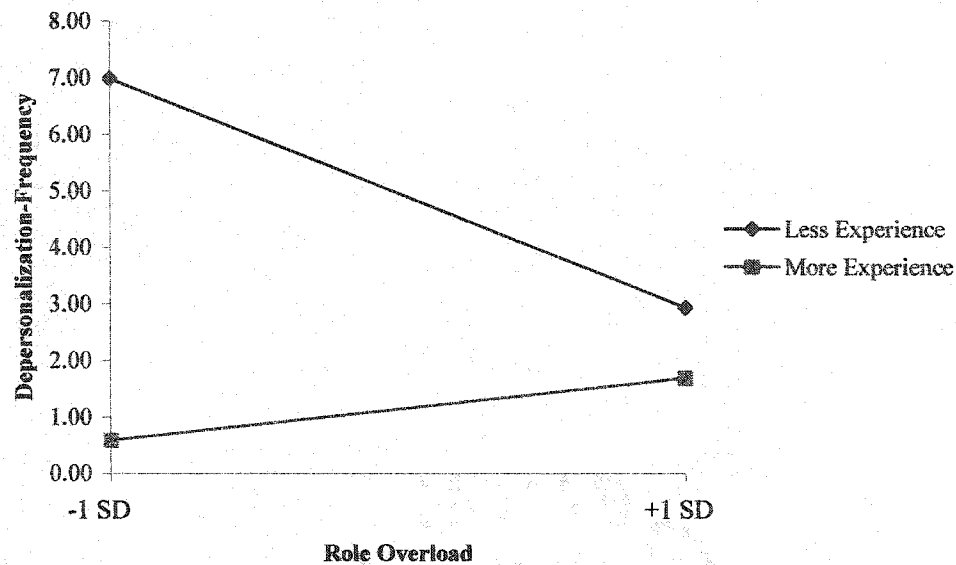
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 17a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Depersonalization-Frequency.

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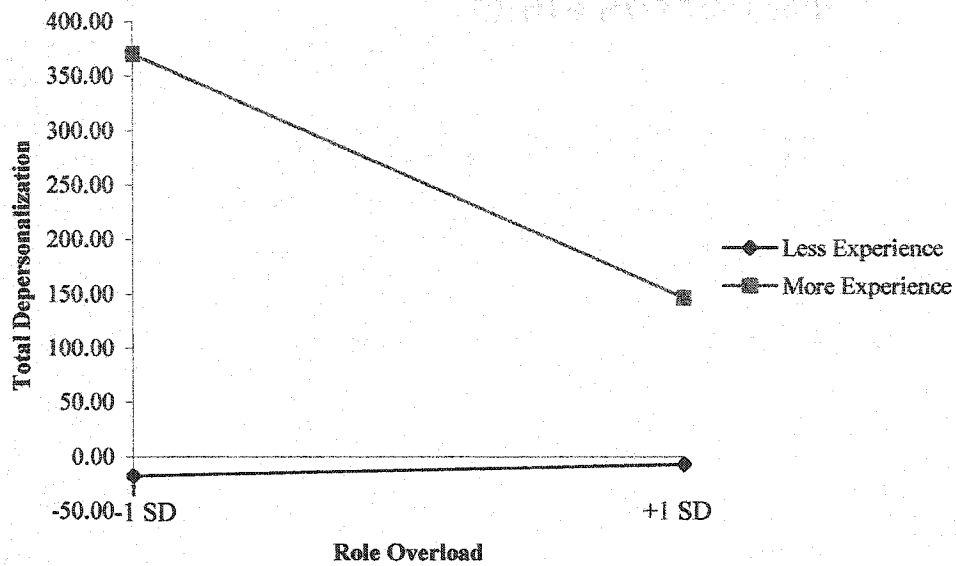
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 17b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Depersonalization-Frequency.

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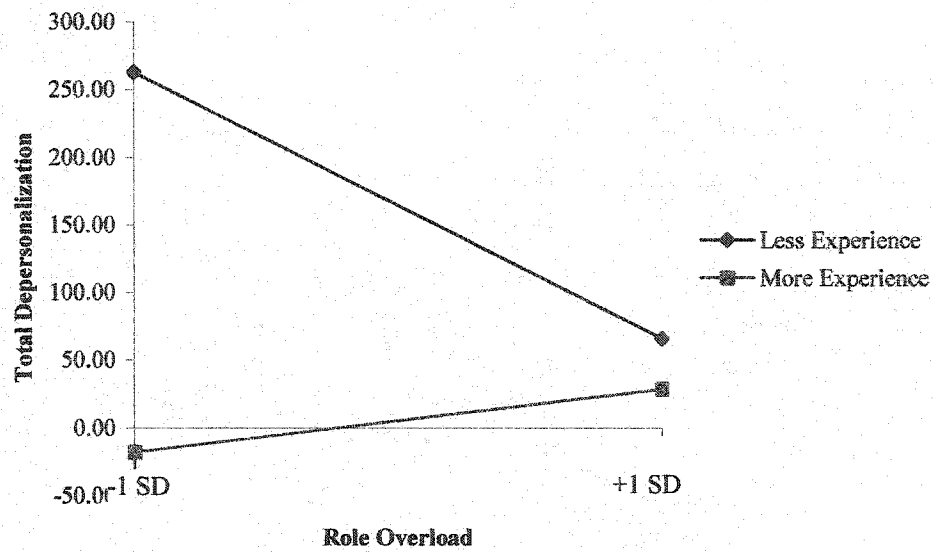
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 18a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Total Depersonalization.

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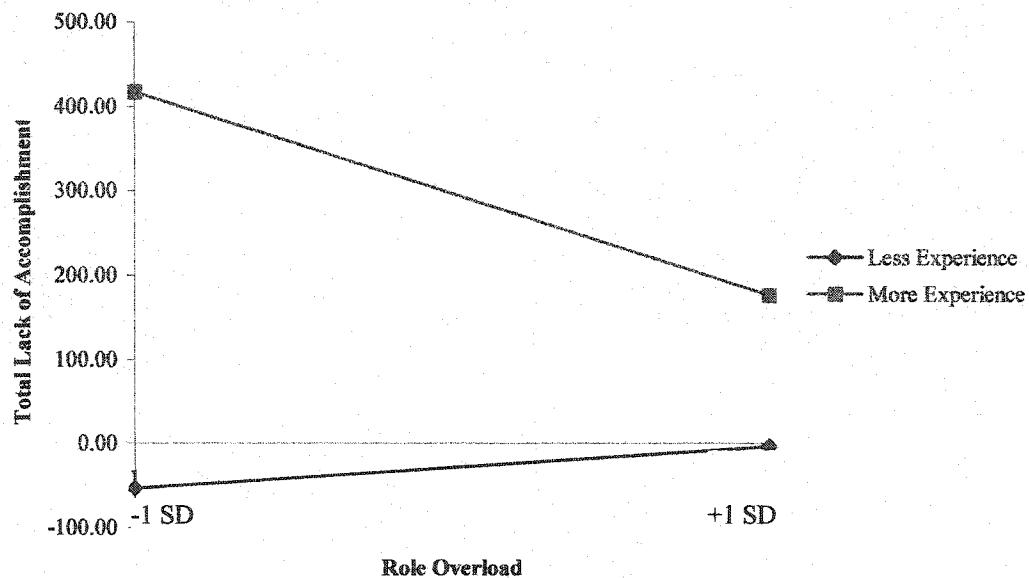
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 18b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Total Depersonalization.

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*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

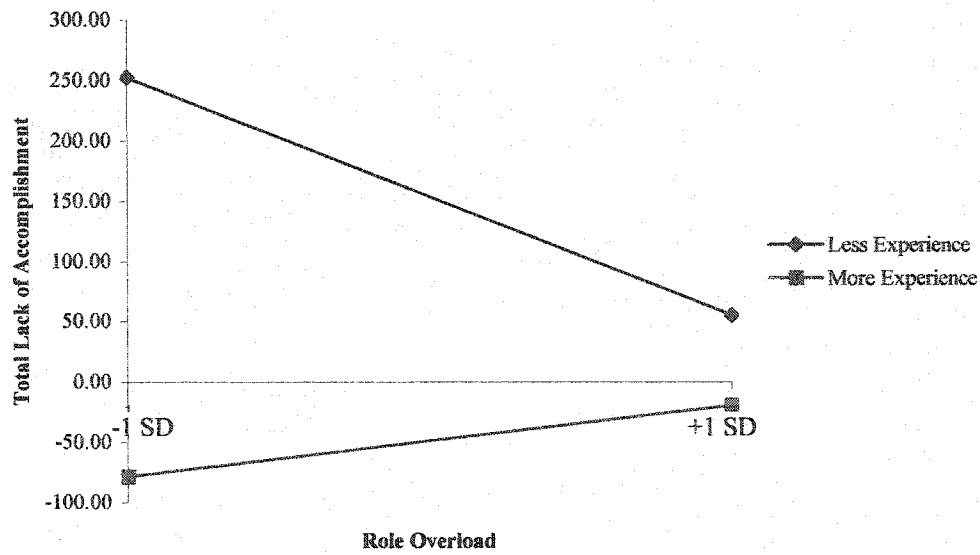


*Figure 19a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Total Lack of Personal Accomplishment.

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*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

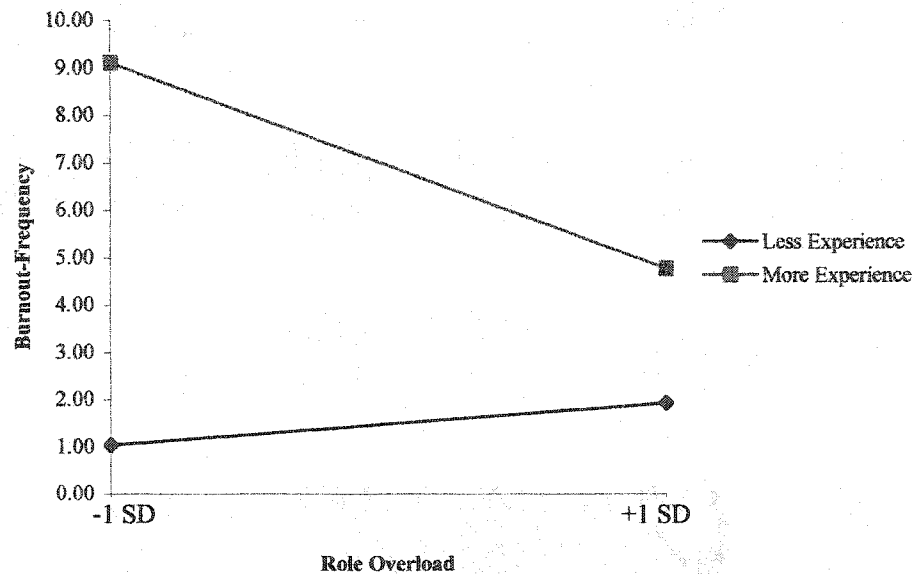




*Figure 19b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Total Lack of Personal Accomplishment.

---

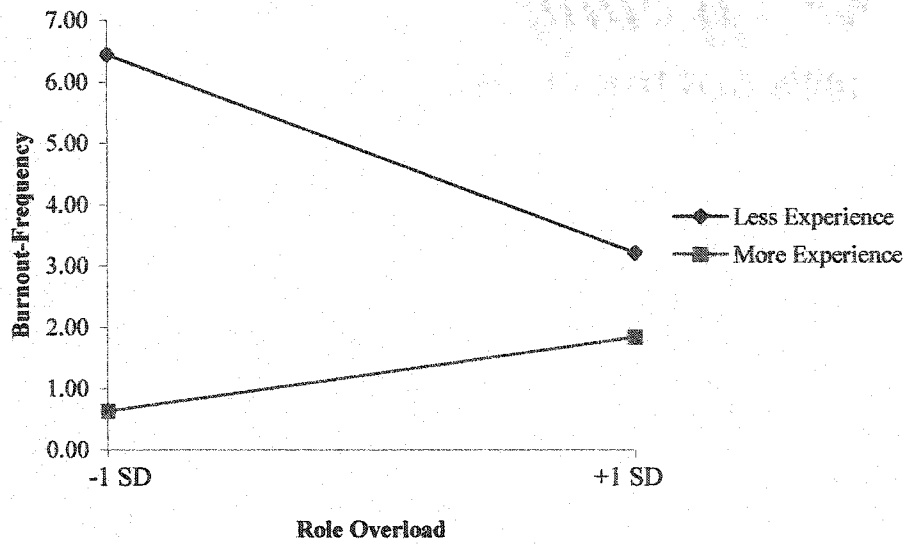
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 20a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Burnout-Frequency.

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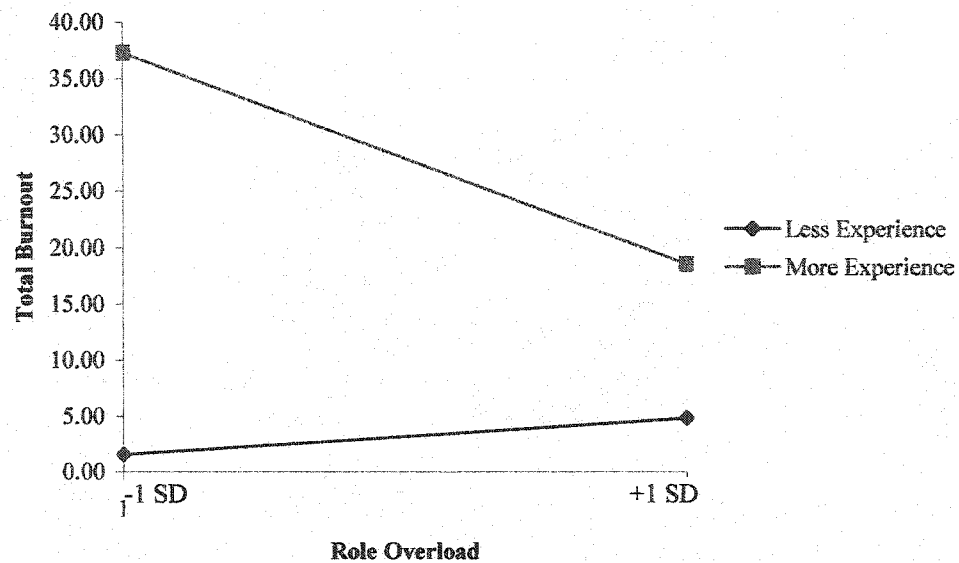
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 20b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Burnout-Frequency.

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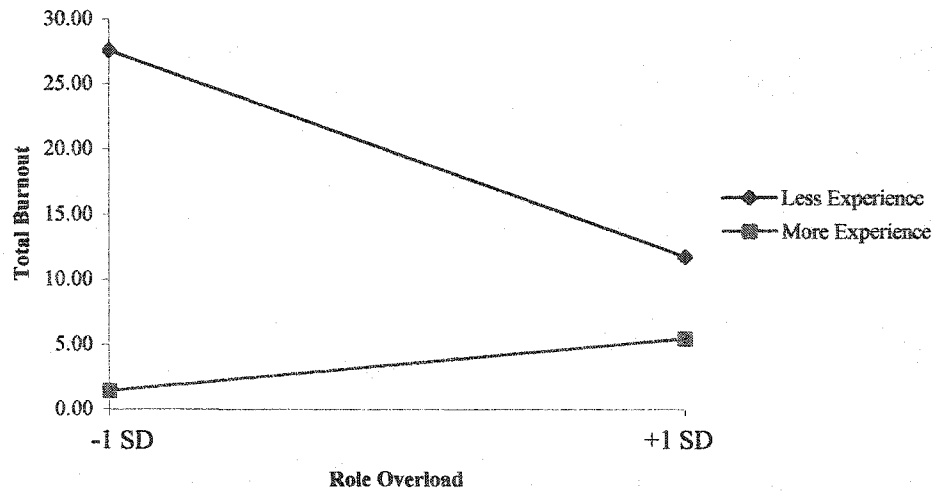
*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 21a.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is Low* on Total Burnout.

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*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).



*Figure 21b.* Three-way Interaction Between Role Overload and Years of Technology Experience when *Technology Appraisals is High* on Total Burnout.

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*Note.* The three-way interaction among role overload, years of experience with technology, and technology appraisals was determined based on the lowest and highest possible mean scores (- 1 SD and + 1 SD).

## Appendix A

### Technostress Among Academic and Public Librarians

#### Survey Questionnaire

The purpose of this survey is to examine job stressors among academic and public librarians in the Northern California Bay Area. Participation in this study is strictly on a voluntary basis. You may refuse to participate in the entire study or in any part of the study. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with San Jose State University. No direct benefit of any kind, to which you are otherwise entitled will be lost or jeopardized if you choose not to participate. In addition, no one will have access to your information and no one will be able to identify you. This survey will not report individual responses, rather, make a generalization about the sample. Although the results of this study may be published, no information that could identify you will be included. This study does not anticipate any risks and the extent to which harm or discomfort is inflicted upon you is no greater than that encountered in your daily life. Questions about the research subjects' rights, or research-related injury may be presented to Nabil Ibrahim, Ph.D., Associate Vice President, Graduate Studies and Research, at (408) 924-2480

The survey will take approximately 15 minutes to complete. Please answer all questions if you can. Your answers are very important and completion of this survey will help to provide a better assessment of how librarians generally feel about technology and it's impact on their work life. This questionnaire is divided into four sections. The first three sections will ask you questions regarding your feelings towards your job and work environment. The last section will ask you questions about your demographics. Please note that questions in section four are only used to describe the study. Again, your responses are anonymous and confidential. After completion of the questionnaire, please seal the questionnaire in the manila envelope provided. The label on the envelope is addressed to me and only my advisor and I will have access to the data.

Results of the survey will be provided to you late June of 2003 via website ([http://www.geocities.com/tulam76/technostress\\_survey.html](http://www.geocities.com/tulam76/technostress_survey.html)). Please keep this document for your records. Should you have any questions or concerns, please contact me at (510) 551-7670.

Your time and effort is much appreciated. Thank you.

Tu P. Lam  
Master of Science Candidate  
Industrial and Organizational Psychology  
San Jose State University  
San Jose, CA USA 95192-0120 USA

Thesis Chair: Dr. Sharon Glazer  
Assistant Professor  
Department of Psychology  
San Jose State University  
San Jose, CA 95192-0120 USA

## Appendix B

## Technostress Among Academic and Public Librarians

## Section I:

**Instructions:** Please indicate the extent to which you agree or disagree with the following statements by circling the appropriate number, from 1 (strongly disagree) to 7 (strongly agree).

Strongly Disagree	Disagree	Somewhat Disagree	Neither Agree or Disagree	Somewhat Agree	Agree	Strongly Agree
1	2	3	4	5	6	7

## A. Job-Related Pressures

Role Overload

1. I receive an assignment without the manpower to complete it..... 1 2 3 4 5 6 7
2. I am given enough time to do what is expected of me on my job..... 1 2 3 4 5 6 7
3. It seems like I have too much work for one person to do..... 1 2 3 4 5 6 7
4. On my present job, the amount of work seems to interfere with how well I can do the job..... 1 2 3 4 5 6 7
5. I often notice a marked increase in my work load..... 1 2 3 4 5 6 7

Role Conflict

1. I have to do things that should be done differently..... 1 2 3 4 5 6 7
2. I work with two or more group who operate quite differently..... 1 2 3 4 5 6 7
3. I receive incompatible requests from two or more people..... 1 2 3 4 5 6 7
4. I do things that are apt to be accepted by one person and not accepted by others..... 1 2 3 4 5 6 7
5. I work on unnecessary things..... 1 2 3 4 5 6 7

Role Ambiguity

1. I feel certain about how much authority I have..... 1 2 3 4 5 6 7
2. I have clear, planned goals and objectives for my job..... 1 2 3 4 5 6 7
3. I know I have divided my time properly..... 1 2 3 4 5 6 7
4. I know exactly what is expected of me..... 1 2 3 4 5 6 7
5. Explanation is clear of what has to be done..... 1 2 3 4 5 6 7

## B. Organizational Commitment

Affective Commitment

1. I would be very happy to spend the rest of my career with this library..... 1 2 3 4 5 6 7
2. I enjoy discussing my library with people outside of it..... 1 2 3 4 5 6 7
3. I really feel as if this library's problems are my own..... 1 2 3 4 5 6 7
4. I think I could easily become attached to another library as I am to this one..... 1 2 3 4 5 6 7
5. I do not feel like "part of the family" at my library..... 1 2 3 4 5 6 7
6. I do not feel "emotionally attached" to this library..... 1 2 3 4 5 6 7
7. This library has a great deal of personal meaning for me..... 1 2 3 4 5 6 7
8. I do not feel a strong sense of belonging to my library..... 1 2 3 4 5 6 7

Continuance Commitment

1. I am not afraid of what might happen if I quit my job without having another one lined up..... 1 2 3 4 5 6 7
2. It would be very hard for me to leave my library right now, even if I wanted to..... 1 2 3 4 5 6 7
3. Too much in my life would be disrupted if I decided I wanted to leave the library now..... 1 2 3 4 5 6 7
4. It wouldn't be too costly for me to leave my library in the near future..... 1 2 3 4 5 6 7
5. Right now, staying with my library is a matter of necessity as much as desire..... 1 2 3 4 5 6 7
6. I feel that I have too few options to consider leaving this library..... 1 2 3 4 5 6 7
7. One of the few negative consequences of leaving this library would be the scarcity of available alternatives..... 1 2 3 4 5 6 7

8. One of the major reasons I continue to work for this library is that leaving would require considerable personal sacrifice-another library may not match the overall benefits I have here..... 1 2 3 4 5 6 7

Section II:

**Instructions:** Please indicate the extent to which you agree or disagree with the following statements by circling the appropriate number, from 1 (strongly disagree) to 7 (strongly agree).

1. I value my experiences with technological innovation in my job..... 1 2 3 4 5 6 7  
 2. Technology has made my work tasks easier to perform..... 1 2 3 4 5 6 7  
 3. Technology has made positive contributions to my job..... 1 2 3 4 5 6 7

Section III:

**Instructions:** Please indicate your feelings, as accurately as possible, in each statement by circling the appropriate number. For **FREQUENCY**, circle the appropriate number, from 1 (a few times a year) to 6 (everyday). For **INTENSITY**, circle the appropriate number, from 1 (very mild, barely noticeable) to 7 (very strong, major). For **NEVER**, mark an X on the line.

	A few times a year	Monthly	A few times a month	Every week	A few times week	Every-day
Frequency:	1	2	3	4	5	6

Intensity:	1	2	3	4	5	6
	Very mild, Barely Noticeable				Moderate	Very Strong

	Frequency	Intensity	Never
<b>A. Emotional Exhaustion</b>			
1. I feel emotionally drained from my work.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
2. I feel used up at the end of the workday.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
3. I feel fatigued when I get up in the morning and have to face another day on the job.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
4. Working with people all day is really a strain for me.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
5. I feel burned out from my work.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
6. I feel frustrated by my job.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
7. I feel I'm working too hard on my job.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
8. Working with people directly puts too much stress on me.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
9. I feel like I'm at the end of my rope.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____

<b>B. Personal Accomplishment</b>			
1. I can easily understand how my patrons feel about things.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
2. I deal very effectively with the problems of my patrons.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
3. I feel I'm positively influencing other people's lives through my work.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
4. I feel very energetic.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
5. I can easily create a relaxed atmosphere with my patrons.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
6. I feel exhilarated after working closely with my patrons.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
7. I have accomplished many worthwhile things in this job.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____
8. In my work, I deal with emotional problems very calmly.....	1 2 3 4 5 6	1 2 3 4 5 6 7	_____



C. Depersonalization

- |                                                                        |             |               |       |
|------------------------------------------------------------------------|-------------|---------------|-------|
| 1. I feel I treat some patrons as if they were impersonal objects..... | 1 2 3 4 5 6 | 1 2 3 4 5 6 7 | _____ |
| 2. I've become more callous toward people since I took this job.....   | 1 2 3 4 5 6 | 1 2 3 4 5 6 7 | _____ |
| 3. I worry that this job is hardening me emotionally.....              | 1 2 3 4 5 6 | 1 2 3 4 5 6 7 | _____ |
| 4. I don't really care what happens to some patrons.....               | 1 2 3 4 5 6 | 1 2 3 4 5 6 7 | _____ |
| 5. I feel patrons blame me for some of their problems.....             | 1 2 3 4 5 6 | 1 2 3 4 5 6 7 | _____ |

## Section IV:

Instructions: For purposes of statistical analysis only, please answer the following questions about yourself. Your answers will remain anonymous. This biographical data is crucial to this research study. Most of the questions listed below are answered by circling a number. Some questions will ask for a number or words. Please write as clearly as possible.

1. Sex    1 Male                    2 Female
2. Age: \_\_\_\_\_ years (as of June 1, 2002)
3. Ethnicity (Please mark all that apply)
  1. African-American or Black American
  2. East Asian American
  3. Southeast Asian American
  4. European-American
  5. Latin/Hispanic American
  6. Native American Indian
  7. Pacific Islander
  8. Other (please specify) \_\_\_\_\_
4. Marital Status:
  1. Single
  2. Married/Re-Married
  3. Living with partner (s)
  4. Divorced/separated
  5. Windowed/widower
  6. Other (please specify) \_\_\_\_\_
5. Highest academic degree
  1. Bachelors degree
  2. Master's degree
  3. Doctorate
  4. Other (please specify) \_\_\_\_\_
6. Job Title \_\_\_\_\_
7. Employment status:
  1. Full-time
  2. Part-time (please specify hours) \_\_\_\_\_
8. Years spent as a librarian \_\_\_\_\_ years \_\_\_\_\_ months
9. Approximate number of patrons you personally help each working day \_\_\_\_\_
10. I use the following technology to in my job
  - \_\_\_\_\_ CD-ROMs
  - \_\_\_\_\_ Computers
  - \_\_\_\_\_ E-mail
  - \_\_\_\_\_ Fax machines
  - \_\_\_\_\_ Internet browsers

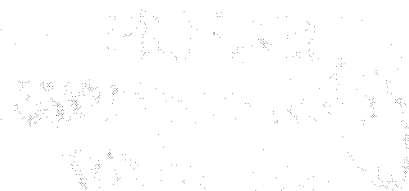
11. Years of experience using technology \_\_\_\_\_

12. Additional comments:

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THANK YOU very much for your participation in filling out this questionnaire.





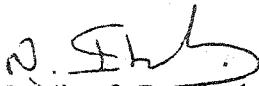
**San José State  
UNIVERSITY**

**Office of the Academic  
Vice President**

**Associate Vice President  
Graduate Studies and Research**

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Voice: 408-283-7500  
Fax: 408-924-2477  
E-mail: [gstudies@wahoo.sjsu.edu](mailto:gstudies@wahoo.sjsu.edu)  
<http://www.sjsu.edu>

To: Tu P. Lam

From: Nabil Ibrahim,   
AVP, Graduate Studies & Research

Date: June 24, 2002

The Human Subjects-Institutional Review Board has approved your request for exemption from human subject's review under category "B" in the study entitled:

"Technostress Among Academic and Public Librarians."

This approval is contingent upon the subjects participating in your research project or the subject's data collected for the research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project and concerning all data that may be collected from the subjects. The Board's approval includes continued monitoring of your research to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must immediately notify Nabil Ibrahim, Ph.D. Injury includes but is not limited to bodily harm, psychological trauma, and release of potentially damaging personal information.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services that the subject is receiving or will receive at the institution in which the research is being conducted. This approval is granted for a one-year period and data collection beyond June 24, 2003 requires an extension request.

If you have any questions, please contact me at (408) 924-2480.