Work and Family Sources of Burnout in the Australian Engineering Profession: Comparison of Respondents in Dual- and Single-Earner Couples, Parents, and Nonparents

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Abstract: A survey of practicing professional civil engineers in the Australian states of New South Wales and Victoria was conducted. The survey explored the engineers' experience of work and family sources of burnout. Burnout was predicted by a combination of both work and family stressors. Regression analysis revealed that burnout was predicted by different variables among respondents in dual- compared to single-income households and among parents and nonparents. Family variables were more important sources of burnout among participants in dual-income households and parents. The writer concludes that preventive strategies for burnout in the engineering profession must extend beyond the work environment and deal with issues at the work-family interface. Also, sociodemographic characteristics of the workforce must be considered when devising preventive strategies.

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Introduction

Construction Industry

The construction industry is a demanding work environment in which increasingly intense competition and unrealistic client demands have necessitated longer working hours and created higher stress levels for those with the responsibility for the timely delivery of projects. Dainty et al. (1999) suggest that there is a common perception of the construction industry as one in which chaotic work practices prevail and the physical work environment is dangerous and dirty. Perhaps unsurprisingly, the construction industry's performance suffers as a result of its image problems. In the 1999 edition of the American *Jobs Rated Almanac*, civil engineering fell from the 18th to 70th position in expressed job preference, while 14 other construction trades languished in the bottom ranks. It is very likely that the construction industry's ability to attract high-quality employees will be limited in these circumstances. Furthermore, at a professional level, research suggests that the construction industry experiences a high level of employee turnover. For example, in a recent British study, Ford (1997) reports 42% of construction professionals were actively looking for new positions. High turnover represents a costly waste for construction organizations. One American estimate suggests that, after 10 years of service an employer will have invested a minimum of $600,000 in an employed engineer, in terms of training, recruitment, salary, and benefits (Maskell-Pretz 1997). It is likely that the construction industry will need to improve its image and become perceived as a good industry in which to work if it is to continue to prosper and grow.

Job Stress

Job stress is commonly defined in terms of role demands originating in the work environment (Cooper and Marshall 1977; Carayon 1992). Construction industry professionals are likely to be exposed to many known stressors during the course of their work. Workloads in construction are notoriously high and work hours are long and rigid often involving significant amounts of unpaid overtime for professionals. A recent survey confirmed that Australian engineers experience considerable time-related work pressures (Association of Professional Engineers, Scientists, and Managers, Australia, Personal Communication, 2000). Over the 12 month period studied, engineers reported that the amount of work to be done had increased (63%), the pace of work had increased (62%), and that the amount of stress had increased (52%). Conflict is another known work stressor likely to be experienced by construction professionals. Conflict can be interpersonal, which is commonplace in the adversarial and dispute-ridden construction industry. However, conflict can also occur between an individual's multiple roles, for example, when two or more incompatible demands must be met simultaneously. Bacharach et al. (1991) suggest that for engineers, role conflict, for example, between professional standards and budget constraints, may be strongly associated with severe life and death consequences increasing the level of stress. Such conflict is likely to be even more stressful in the context of managers' and professionals' increasing personal liability in the event of unforeseen incidents, such as workplace deaths and serious injuries.

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Burnout

Freudenberger (1974) used the term burnout to describe a state of chronic emotional fatigue. Since then, burnout has been the subject of much research and is believed to be a common reaction to exposure to extreme levels of job stress [see Lee and Ashforth (1990); Cordes and Dougherty (1993) for a review of the early research]. The most widely accepted definition of burnout conceptualizes the phenomenon as a syndrome of emotional exhaustion, depersonalization, and reduced personal accomplishment (Maslach et al. 1996). This definition was originally used to describe burnout in the human service or caring professions but it is now well established that burnout can also occur among other occupational groups. Thus, Maslach and her colleagues have developed a slightly different model of burnout for workers outside the human services field in which depersonalization is replaced by the concept of cynicism. Cynicism is indicative of a more general withdrawal from work involvement rather than a personal distancing from an individual client. In this general burnout model, emotional exhaustion describes feelings of depleted emotional resources and a lack of energy. In this state, employees feel unable to give of themselves at a psychological level. Cynicism is characterized by a diminished interest in and exaggerated distancing from one's work. Reduced personal accomplishment refers to a situation in which employees tend to evaluate themselves negatively and become dissatisfied with their accomplishments at work.

Consequences of Burnout

Research suggests that burnout is associated with negative outcomes for both individuals and organizations. At an individual level, burnout has been associated with the experience of psychological distress, anxiety, depression, reduced self-esteem, and substance abuse (Maslach et al. 1996). Some studies also identify a link between burnout and coronary heart disease (Appels and Schouten 1991; Tennant 1996), suggesting that burnout should be treated as part of a company's occupational health program. Australian research has found that, while the number of claims for stress-related illnesses, including burnout, represent only a small proportion of the total number of employees' compensation claims, the costs of these claims represents a major proportion of all compensation costs (Cotton 1995). Research also consistently links burnout to lower levels of organizational effectiveness. Burnout has been consistently associated with absenteeism, turnover, reduced productivity, and lower levels of job satisfaction and organizational commitment (Maslach et al. 2001).

Organizations operating in high-stress environments, including construction, should consider the impact of exposure to job stressors on their employees' mental health. Not only is there a moral obligation incumbent upon employers to protect the health, safety, and well-being of their workforce but it is increasingly recognized that work-related stress problems, including burnout, are harmful to an organization's business performance. Given the fact that low retention rates are a known problem in the construction industry, a better understanding of the sources of employees' burnout in this sector is needed.

Work-Family Interface

Burnout was originally believed to be a uniquely work-related phenomenon. However, there is a growing understanding that employees' work and nonwork lives cannot be treated as mutually exclusive, separate spheres. Instead, it is now proven that events in one life domain, such as work, spill over to impact upon experiences in another domain, such as home life (Grzywacz et al. 2002). This spillover can be in the form of time-based interference, such that excessive involvement in one domain prevents the employee from participating fully in the other domain. However, spillover can also occur when stressors in the work and nonwork environments are experienced simultaneously (Bolger et al. 1989) or moods are transferred from one domain to another (Williams and Alliger 1994; Repetti and Wood 1997). Thus, it is not only possible that burnout occurs as a result of experiencing stressors at work and in other life domains simultaneously, but that work-related burnout can be transferred to other domains including family life.

Accordingly, writers on burnout now acknowledge that burnout is the result of a complex interaction of factors in employees' work and nonwork lives (Maslach et al. 1996; Carroll and White 1982). Empirical research data support this ecological model (Dolan 1995; Gmelch and Gates 1998). However, there is evidence that demographic characteristics of employees influence the relative contribution of work and nonwork variables in predictions of burnout. For example, Aryee (1993) undertook a study of participants in dual-earner couples in Singapore and found that burnout was predicted by both work and nonwork variables among women but was only predicted by work variables among men in the sample. Recent research also suggests that work-related burnout can be transmitted between partners in dual-earner couples (Westman and Etzion 1995; Westman et al. 2001) indicating the complex and dynamic relationship between stressful events at home and at work.

Changing Family Structures

Much of the burnout research does not consider the experiences and challenges faced by subpopulations of workers, for example, parents and childless employees or employees participating in dual-earner as compared to single-earner households. However, if it is accepted that burnout occurs as a result of stressful events both at work and at home, it seems likely that these characteristics will impact upon employees' experiences. Research suggests that employees in dual-earner couples experience different demands to those in single-earner households (Rapoport and Rapoport 1971; Gupta and Jenkins 1985; Greenhaus et al. 1989; Bunker et al. 1992). Jacobs and Gerson (2001) suggest that the dramatic increase in dual-earner couples, rather than the fact that people are working longer hours, is the single most important cause of work-life balance difficulties. They suggest that, rather than focus on the workload of individuals, the focus should be on the workload of the family as a whole and the extent to which the family is overloaded. There is also evidence that employed parents also experience role conflict and stress associated with balancing the requirements of parenthood with those of employee (Williams and Alliger 1994; Repetti and Wood 1997). This role stress is likely to be more acute in dual-earner couples. For example, a recent Australian report found that, in dual-earner households, 70% of all mothers and 56% of all fathers reported that they always or often felt rushed or pressed for time. This compares to 25.2% of couples without children who reported experiencing this feeling with the same frequency (Australian 1999). Given women's increased participation in the paid workforce and the consequent changes to traditional family structures that have occurred in recent decades, a better understanding of the work and family sources of burnout among both parents and nonparents is needed.

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Aims of Study

Despite the fact that construction professionals are likely to be a high-risk group for burnout, little work has been undertaken to explore the burnout phenomenon in the construction industry. This paper reports the results of the first stage of a project seeking to fill this gap. The study aimed to explore the sources of burnout in a sample of civil engineers working in the Australian construction industry and to determine whether family or household characteristics have an impact on engineers' experience of burnout. Specific objectives of the study were as follows:

- To identify work and family sources of burnout in Australian civil engineers;
- To compare work and family sources of burnout in engineers participating in dual-earner and single-earner households; and
- To compare work and family sources of burnout in engineers who are parents and those who are childless.

Methodology

Sampling Strategy

A questionnaire survey of Australian civil engineers was conducted. Data were obtained from civil engineers engaged in professional practice in consulting and contracting organizations in New South Wales and Victoria. In the first instance, a register of companies employing civil engineers was obtained from the Institution of Engineers, Australia. General managers or human resources managers of listed companies were approached and asked whether the company would participate in the study. At this stage, the managers were briefed on the objectives of the study. Questionnaires were randomly distributed through the internal mail systems of the companies that agreed to participate. Completed questionnaires were returned directly to the researchers in unmarked postage-paid envelopes provided for this purpose. Each questionnaire was distributed with a copy of a plain language statement describing the objectives of the study. The statement also explained the voluntary nature of respondent participation and assured anonymity of respondents and confidentiality of responses.

Questionnaire Design

The questionnaire was designed to collect information relating to respondents' work and family situations and to measure burnout. Data collected and measurement methods are described as follows.

Demographic information collected included the respondents' age, gender, and marital/relationship status. Respondents were also asked to provide information about their partners' employment status, the number of children they have, and the age of their youngest child.

Job characteristics were measured using a 36-item instrument. The scale was designed to tap dimensions likely to be relevant to the work of construction industry professionals. These were subjective overload (I never seem to have enough time to get everything done); responsibility (the safety of others depends on me); role conflict (I can't satisfy everybody at the same time); satisfaction with promotion prospects (the chances for promotion are good); role clarity (I know exactly what is expected of me); social satisfaction (the people I work with are friendly); control over work pace (I determine the speed at which I work); and satisfaction with pay (I am very happy with the amount of money I make). Satisfaction with job security was assessed with a single item (the job security is good). Respondents were asked to rate items on a Likert-type scale ranging from 1 (strongly disagree) to 7 (strongly agree). Respondents were also asked to indicate the average number of hours they work each week.

Satisfaction and conflict in respondents' relationships with their spouses or partners were measured using an 18-item instrument developed by Orden and Bradburn (1968). This instrument asks respondents to rate the frequency with which they engaged in nine satisfying activities, for example gone out together—to a cinema, to play a sport, or other entertainment, within the few weeks prior to their completion of the questionnaire. The scale also asks respondents to indicate the frequency with which they experienced conflict in relation to nine aspects of their relationship, for example, being away from home, in the same period.

Burnout was measured using the *Maslach Burnout Inventory*—General Survey (Maslach et al. 1996). This 16-item inventory comprises three subscales assessing emotional exhaustion (I feel emotionally drained from my work), cynicism (I have become less interested in my work since I started this job), and a diminished sense of personal efficacy. The items for the third dimension of burnout are framed in positive terms and thus a low score reflects a low sense of personal efficacy (at work, I feel confident that I am effective at getting things done). The Maslach Burnout Inventory (MBI) was selected for use due to its brevity and proven reliability and validity of results (Schutte et al. 2000; Corcoran 1995; Shinn 1982). Following Maslach et al. (1996), since the response formats of intensity and frequency have been found to be highly correlated, only frequency ratings were used. Items are rated on a seven-point Likert scale ranging from never (0) to everyday (6).

Data Analysis

Multidimensional scales, such as burnout, job demands, and relationship quality were factor analyzed using the principal components method with varimax rotation. This allowed confirmation that the items loaded consistently on the expected factors and enabled the internal consistency reliability of the scales to be determined prior to further analysis. Factor scores were then used in further statistical analyses described below.

In order to compare the experienced burnout of different groups of employees, such as male and female employees, statistical tests were conducted to compare the mean scores for the burnout dimensions. Pairwise T-tests were used to identify significant differences among two sample means. The differences in means are expressed as coefficients (t) and their significance is indicated by a probability level (p).

Pearson correlation coefficients (denoted r) were calculated to determine the strength of association between variables. These correlation coefficients indicate the strength of the linear association between two variables. Following the correlation analysis, multiple regression procedures were used to determine the extent to which the burnout dimensions could be predicted by the independent variables, in this case, respondents' family and job characteristics. This analysis enabled the relative importance of job and family characteristics in predicting the civil engineers' burnout to be determined. Thus, Beta coefficients (denoted β) were compared for the independent variables in each regression model.

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Table 1. Pearson Correlation Coefficients for Family Variables, Job Demands, and Burnout

Variable	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Number of children	1.000																			
Age of youngest child	0.242[c]	1.000																		
Age of respondent	0.699[a]	0.808[a]	1.000																	
Hours worked each week	0.217[b]	−0.178	0.160[c]	1.000																
Job security	−0.021	0.083	−0.175[c]	−0.177[c]	1.000															
Overload (work)	0.115	0.024	0.150[c]	0.366[a]	−0.236[b]	1.000														
Responsibility (work)	0.308[a]	0.079	0.383[a]	0.266[a]	−0.044	0.000	1.000													
Role clarity (work)	0.121	−0.041	0.022	0.014	0.143	0.000	0.000	1.000												
Satisfaction with pay	0.219[b]	0.312[b]	0.293[a]	0.059	0.081	0.000	0.000	0.000	1.000											
Promotion satisfaction	0.107	0.138	0.021	0.011	0.242[a]	0.000	0.000	0.000	0.000	1.000										
Role conflict (work)	−0.055	−0.237[c]	−0.185[c]	0.172[c]	0.062	0.000	0.000	0.000	0.000	0.000	1.00									
Social satisfaction (work)	−0.112	0.012	−0.181[c]	−0.122	0.247[a]	0.000	0.000	0.000	0.000	0.000	0.000	1.000								
Pace control	0.136	0.156	0.103	0.114	0.120	0.000	0.000	0.000	0.000	0.000	0.000	0.000	1.000							
Marital satisfaction	−0.345[a]	0.038	−0.325[a]	−0.223[b]	0.040	−0.175[c]	−0.184[c]	−0.009	−0.049	0.146	0.089	0.029	−0.001	1.000						
Marital conflict	−0.047	−0.303[b]	−0.170[c]	0.244[c]	−0.090	0.117	−0.051	−0.008	−0.219[b]	−0.062	0.236[b]	0.003	−0.025	0.000	1.000					
Social relations	0.041	0.063	0.059	0.027	−0.007	−0.061	0.039	−0.018	−0.051	0.214[c]	−0.025	−0.013	−0.004	0.000	0.000	1.000				
Emotional exhaustion	−0.051	−0.239[c]	−0.128	0.306[a]	−0.140	0.351[a]	0.086	−0.068	−0.134	−0.100	0.275[a]	−0.111	−0.028	−0.091	0.314[a]	0.016	1.000			
Cynicism	−0.240[a]	−0.187	−0.193[c]	−0.090	−0.162[c]	−0.041	−0.228[b]	−0.193[c]	−0.151[c]	−0.381[a]	0.131	−0.131	−0.041	0.181[c]	0.057	−0.115	0.000	1.000		
Personal competence	0.043	0.029	−0.006	0.139	0.182	0.034	0.059	0.202[b]	0.049	−0.038	0.021	0.115	0.065	0.012	−0.034	0.002	0.000	0.000	1.000	
Professional worth	0.073	0.091	−0.011	−0.011	−0.028	−0.140	0.092	0.010	−0.088	0.197[b]	0.105	0.051	0.143	0.117	0.079	0.220[b]	0.000	0.000	0.000	1.000

[a]Correlation is significant at the 0.001 level (two-tailed).

[b]Correlation is significant at the 0.01 level (two-tailed).

[c]Correlation is significant at the 0.05 level (two-tailed).

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Results

Sample

Of 500 questionnaires distributed, 182 completed and usable ones were returned yielding a response rate of 36%. The majority of respondents (92.3%) were male. Only 7.7% of the sample were female. Respondents were also predominantly employed in consulting roles (84.6%). Only 11% of respondents indicated they worked for a contracting organization and 1.6% reported working for a supplier. Reflecting this, 81.3% of respondents indicated that they spent most of their time at work in an office environment. Only 7% reported that they were site-based and 10.4% indicated that their job involved both office and site-based work. The majority of respondents (65.4%) were married. A further 17.6% indicated that they were involved. Only 15.9% of respondents were single and 1.1% indicated that they were divorced. Most respondents were participants in dual-income families. Of those respondents who were married or involved, 60.4% had a partner or spouse in a paid job. Only 22% of respondents in a relationship had a partner or spouse who was not in a paid job. The sample contained roughly equal numbers of parents (51.1%) and nonparents (48.4%).

Factorial Structure of Burnout in Sample

While burnout is usually conceptualized as a three-factor phenomenon, there is an ongoing debate as to its factorial structure. For example, in a recent Australian study, Densten (2001) identified a five-factor burnout model. Results of the principal components factor analysis of the current data suggest that a four-factor model of burnout is the most parsimonious. Emotional exhaustion and cynicism items loaded as expected. However, the personal efficacy items broke down into separate factors. Items loading on the fourth factor were examined and appeared to relate to a sense of professional worth (I feel exhilarated when I accomplish something worthwhile in my job) as distinct from personal competence (I feel confident that I am effective at getting things done). This suggests that Australian civil engineers experience a sense of personal competence as distinct from a sense of making a valuable professional contribution to society. The results of this factor analysis are presented and discussed elsewhere (Lingard 2003) and will not be discussed in detail in this paper.

Comparisons by Gender, Marital Status, and Work Location

T-tests were conducted to ascertain whether significant differences existed between the burnout scores of respondents who differed in terms of gender, marital status, or work location (e.g., site or office). With an alpha level of 0.05, no significant differences in burnout were found between male and female respondents. However, this finding must be interpreted with caution owing to the very small number of women in the sample (7.8% of the total). Using the same alpha level, T-tests also revealed no significant differences between partnered and single employees, nor was there a significant difference between site-based and office-based employees. On this basis, these variables were excluded from the regression analyses.

Bivariate Correlations

Pearson correlation coefficients were calculated between the burnout dimensions, job characteristics, and family variables. Family variables included the satisfaction and conflict in relationship with spouse/partner, number of children, and age of youngest child. These correlation coefficients are presented in Table 1.

As Table 1 shows, the work and family variables were differentially correlated with the four dimensions of burnout. Emotional exhaustion was inversely correlated with age of youngest child ($r=-0.193$, $p=0.011$) and positively correlated with hours worked per week ($r=0.306$, $p=0.000$), subjective overload ($r=0.351$, $p=0.000$), job-role conflict ($r=0.275$, $p=0.000$), and conflict in relationship with spouse or partner (0.314, $p=0.000$). Cynicism was inversely correlated with respondents' number of children ($r=-0.240$, $p=0.001$), age of respondent ($r=-0.193$, $p=0.011$), satisfaction with job security ($r=-0.162$, $p=0.033$), perceived responsibility at work ($r=-0.228$, $p=0.003$), clarity of roles at work ($r=-0.193$, $p=0.011$), satisfaction with pay ($r=-0.151$, $p=0.048$), and satisfaction with promotion prospects ($r=-0.381$, $p=0.000$). Cynicism was positively associated with respondents' stated satisfaction in their relationships with their spouses or partners ($r=0.181$, $p=0.032$). The personal competence dimension of burnout was positively correlated with satisfaction with job security ($r=0.182$, $p=0.016$) and clarity of roles at work ($r=0.202$, $p=0.008$). Professional worth was positively correlated with satisfaction with promotion prospects ($r=0.197$, $p=0.010$) and the social relations dimension of relationship satisfaction ($r=0.220$, $p=0.009$).

Table 2. Work and Family Predictors of Burnout

Variables	R^2 (cumulative)	Adjusted R^2 (cumulative)	Beta (β)	p
Emotional exhaustion				
Relationship conflict	0.211	0.202	0.351	0.001
Overload	0.288	0.270	0.296	0.002
Role conflict (work)	0.348	0.323	0.261	0.008
Cynicism				
Satisfaction with promotion prospects	0.150	0.144	−0.423	0.000
Relationship satisfaction (spouse/partner)	0.213	0.201	0.219	0.005
Clarity of role (work)	0.242	0.225	−0.179	0.018
Responsibility (work)	0.268	0.246	−0.167	0.030
Personal competence				
Clarity of role (work)	0.041	0.035	0.177	0.021
Satisfaction with job security	0.063	0.052	0.150	0.048

Predictors of Burnout

Owing to the large number of independent variables, only those work and family variables that correlated significantly with the burnout dimensions were entered into the regression models for each dimension. Table 2 shows the results of stepwise multiple regression analyses for each of the burnout dimensions.

Of those variables entered into the model for emotional exhaustion, age of youngest child and hours worked each week were not found to be significant predictors. Conflict in relationship with spouse/partner emerged as the strongest predictor of emotional exhaustion ($\beta=0.351$, $p=0.001$) followed by subjective overload ($\beta=0.296$, $p=0.002$) and role conflict at work ($\beta=0.261$, $p=0.008$). Overall, the model explained 32% of variation in emotional exhaustion (adjusted $R^2=0.323$).

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Table 3. Predictors of Emotional Exhaustion for Respondents in Dual- and Single-Earner Households

Single-income participants			Dual-income participants		
Variable	Beta (β)	*p*	Variable	Beta (β)	*p*
Conflict in relationship with spouse/partner	0.480	0.003	Conflict in relationship with spouse/partner	0.377	0.005
			Hours worked per week	0.376	0.005
Adjusted R^2	0.280	—	Adjusted R^2	0.319	—

Of the significant correlates of cynicism, satisfaction with promotion prospects ($\beta=-0.423$, $p=0.000$), satisfaction in relationship with partner/spouse ($\beta=0.219$, $p=0.005$), clarity of role ($\beta=-0.179$, $p=0.018$), and responsibility ($\beta=-0.167$, $p=0.030$) at work emerged as significant predictors of cynicism. Overall, the model explained 25% of the variation in cynicism (adjusted $R^2=0.246$)

Only 5% of the variation in the personal competence dimension of burnout was explained by the work and family variables in the regression model (adjusted $R^2=0.052$). Significant predictors were clarity of role at work ($\beta=0.177$, $p=0.021$) and satisfaction with job security ($\beta=0.150$, $p=0.048$). No significant predictors were found for the professional worth dimension of burnout. Due to the low level of variation explained by the regression models for both of the personal efficacy dimensions of burnout, these were excluded from further regression analyses.

Dual- and Single-Earner Couples

In order to test whether respondents who reported their partners to be in a paid position experienced different levels of burnout to those whose partners were not, T-tests were conducted. No significant differences were observed for the emotional exhaustion, cynicism, or personal efficacy dimensions of burnout.

In order to determine whether predictors of burnout differed between participants in single- and dual-earner households, further regression analyses were conducted. First, the sample was split into two groups—those with partners in paid employment and those whose partners were not. Second, the burnout dimensions were regressed on all of their significant correlates (as shown in Table 1). Separate regression models were generated for respondents in dual- and single-earner households. The results of these analyses are presented in Tables 3 and 4.

The model for participants in dual-earner households explained a greater amount of variation in emotional exhaustion (32%) than that for participants in single-earner households (28%). The predictive ability of conflict in relationship with spouse and partner was common for both groups but the number of hours worked per week emerged as a significant predictor of emotional exhaustion among participants whose spouse or partner worked but did not predict exhaustion among participants in single-earner households.

The independent variables predicted 41% (adjusted $R^2=0.414$) of variation in cynicism among participants in single-earner households, compared to only 28% (adjusted $R^2=0.280$) among those whose partners are also in paid employment. Satisfaction with promotion prospects was the strongest predictor for each group. However, other than satisfaction with promotion prospects, cynicism in the two groups was predicted by different independent variables. Age ($\beta=0.338$, $p=0.011$) and satisfaction with pay ($\beta=-0.333$, $p=0.012$) were significant predictors of cynicism among participants whose partners did not work, while satisfaction in relationship with spouse ($\beta=0.324$, $p=0.000$) and clarity of role at work ($\beta=-0.277$, $p=0.002$) were significant predictors of cynicism among participants in dual-earner households.

Parents and Childless Respondents

In order to test whether respondents who had dependent children experienced different levels of burnout to childless respondents, T-tests were conducted. No significant differences were observed for the emotional exhaustion and personal efficacy dimensions of burnout. However, parents reported significantly lower levels of cynicism than nonparents ($t=-2.476$, $p=0.014$).

In order to determine whether predictors of burnout differed between parents and nonparents, further regression analyses were conducted. First, the sample was split into two groups—those with dependent children and those without dependent children. Then, the burnout dimensions were regressed on all of their significant correlates (Table 1). Separate regression models were generated for parents and nonparents. The results of these analyses are presented in Tables 5 and 6.

The adjusted R^2 figures in Table 5 reveal that the work and family variables included in our study explain a much greater amount of variation in emotional exhaustion among participants with children (32%) than those without children (16%). Also, different variables predict emotional exhaustion among parents

Table 4. Predictors of Cynicism for Respondents in Dual- and Single-Earner Households

Single-income participants			Dual-income participants		
Variable	Beta (β)	*p*	Variable	Beta (β)	*p*
Satisfaction with promotion prospects	−0.369	0.006	Satisfaction with promotion prospects	−0.408	0.000
Age	−0.338	0.011	Satisfaction in relationship with spouse/partner	0.324	0.000
Satisfaction with pay	−0.333	0.012	Clarity of role (work)	−0.277	0.002
Adjusted R^2	0.414	—	Adjusted R^2	0.280	—

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Table 5. Predictors of Emotional Exhaustion among Parents and Childless Respondents

Childless			Parents		
Variable	Beta (β)	p	Variable	Beta (β)	p
Hours	0.418	0.002	Conflict in relationship with partner/spouse	0.351	0.001
			Subjective overload	0.296	0.002
			Role conflict (work)	0.261	0.008
Adjusted R^2	0.159	—	Adjusted R^2	0.323	—

and nonparents. Emotional exhaustion in parents is predicted by conflict in relationship with spouse/partner ($\beta=-0.351$, $p=0.001$), subjective overload ($\beta=-0.296$, $p=0.002$), and role conflict at work ($\beta=-0.261$, $p=0.008$). By comparison, work hours were the only significant predictor of emotional exhaustion among childless respondents.

The adjusted R^2 figures in Table 6 reveal that the work and family variables included in our study explain a much greater amount of variability in cynicism among participants with children (27%) than those without children (17%). Also, different variables predict cynicism in each group. Predictors of cynicism among respondents who are parents were satisfaction with promotion prospects ($\beta=-0.490$, $p=0.000$), satisfaction in relationship with spouse/partner ($\beta=0.265$, $p=0.007$), and responsibility at work ($\beta=-0.249$, $p=0.010$). Cynicism in respondents without children was predicted by only two variables: (1) satisfaction with promotion prospects ($\beta=-0.312$, $p=0.016$), and (2) clarity of role at work ($\beta=-0.307$, $p=0.018$).

Discussion

The results of the study suggest that, among Australian civil engineers, burnout arises as a result of a combination of work and family stressors. The work and family variables measured in the study explained 32% of variance in emotional exhaustion, indicating that, in combination, they have good predictive ability for this dimension of burnout. This suggests that companies interested in developing burnout prevention programs should not focus solely on stressors originating in the work environment because this will only address part of the problem. More comprehensive preventive strategies dealing with both work and nonwork sources of burnout are likely to be needed. Such strategies will need to adopt a more holistic approach to helping employees achieve a satisfactory work-life balance.

The results also highlight the need to consider the experiences of different subpopulations within the workforce when devising strategies to prevent employee burnout. Grzywacz et al. (2002) suggest that employees' experiences of job and family demands are deeply embedded in their life-course location. The family-life-course theory holds that employees' temporal contexts will determine the level of strain or burden they bear in relation to work and family. Similarly, socially structured status hierarchies determining the extent to which home management and childcare responsibilities are shared will also influence experiences of work and family stress (Bengtson and Allen 1993). Thus, sociodemographic variables can be expected to play an important part in employees' work experiences. The results of this study support an explanation of burnout based upon the family-life-course theory. While the levels of experienced burnout did not differ between parents and childless respondents or between participants in dual- and single-earner households, the sources of burnout were different among respondents from these subpopulations.

Participants in Dual-Earner Versus Single-Earner Couples

Conflict in respondents' relationships with their partners was a significant predictor of emotional exhaustion for respondents in both dual- and single-earner households. However, hours worked each week was also a significant predictor of emotional exhaustion in respondents in dual-earner households. This could indicate that, in dual-earner households, there is a greater expectation that home management and dependent care responsibilities will be shared. In this context, long work hours may make it difficult to fulfill these nonwork responsibilities leading to a sense of emotional exhaustion. This is consistent with the findings reported by Bacharach et al. (1991) that perceived conflict between work and home roles mediates the job stress–burnout relationship.

Cynicism among participants in dual- and single-earner households was also predicted by different variables. Satisfaction with promotion prospects was a significant predictor of cynicism for both of these groups but satisfaction in relationships with respondents' spouses or partners was a significant predictor of cynicism for participants in dual- but not single-earner households. Unexpectedly, the relationship between cynicism and relationship satisfaction was positive, meaning that, as relationship satisfaction increased, so did the degree of cynicism. Possible explanations for this counterintuitive result may include the fact that dual-earner households have greater income security than single-earner households and consequently the importance of work to both partners might be reduced. Also, given the fact that both partners are in paid employment, it may be more difficult to spend time together and this time might be more highly valued. Thus, the greater the value placed on this time, the more resentful participants will be if they perceive work schedule to be encroaching on this time. This could lead to a distancing from their work, not experienced by respondents in less happy relationships and not perceived to be possible by employees in single-earner households who must fulfill the role of breadwinner.

Table 6. Predictors of Cynicism among Parents and Childless Respondents

Childless			Parents		
Variable	Beta (β)	p	Variable	Beta (β)	p
Satisfaction with promotion prospects	−0.312	0.016	Satisfaction with promotion prospects	−0.490	0.000
Clarity of role at work	−0.307	0.018	Satisfaction in relationship with spouse/partner	0.265	0.007
			Responsibility (work)	−0.249	0.010
Adjusted R^2	0.170		Adjusted R^2	0.274	

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Parents Versus Childless Respondents

The only significant predictor of emotional exhaustion among childless respondents was the number of hours worked each week and this variable explained only 16% of variability in this dimension of burnout. In contrast, the regression model for parents was much more powerful, explaining 32% of variation in emotional exhaustion. Unlike childless respondents, parents' emotional exhaustion was not predicted by work hours. Instead, emotional exhaustion among parents was predicted by conflict in the relationship with their spouses or partners, subjective overload, and role conflict at work. These findings suggest that the onset of emotional exhaustion in parents may be more complex than it is for childless employees. Subjective overload is the feeling of having too many things to do in the time available. Wallace (1997) argues that it is important to distinguish between the number of hours worked and subjective overload because the latter is more important in predicting negative work-life effects. Hours have also been found to be less important predictors of relationship quality than subjective overload among male participants in dual-earner couples (Crouter et al. 2001). Reasons for this difference are not clear but they imply that, when children are present in a family, employees experience a greater sense of conflict and experience difficulty achieving a balance between their work and their nonwork lives. In combination, these work and family stressors contribute significantly to burnout among working parents. By comparison, childless employees experience emotional exhaustion but the source of this exhaustion is not as complex. Exhaustion in childless employees is associated with the number of hours worked rather than subjective feelings of conflict and overload. The position of childless employees in company hierarchies was not determined in this study, although it is possible that childless employees experience exhaustion due to time spent at work in pursuit of career advancement. The impact of career aspirations on the experience of burnout warrants further investigation.

Satisfaction with promotion prospects was a significant predictor of cynicism for both childless respondents and those with dependent children. However, satisfaction in relationship with spouse/partner was also a significant predictor of cynicism among parents but not childless respondents. Again, the relationship was positive, which was unexpected. One possible explanation for this finding is that parents derive greater fulfillment from their lives outside work than do childless employees. Thus, the more satisfied employees are in their family lives, the less involved they feel with their work because they place greater importance on family life. These explanations are speculative and the causal links between family antecedents and burnout need further examination.

Conclusions

The combination of work and family predictors of burnout suggest that the burnout concept should not be viewed as occurring exclusively as a result of stressors in the work domain. Instead, an ecological view of burnout, in which burnout arises as a result of a complex interaction between work and nonwork experiences is more appropriate. The results also suggest that, in the identification and prevention of burnout, greater attention should be paid to issues at the work-family interface. Policies and programs to address burnout are required for all employees because no significant differences were observed in the level of burnout experienced by the different demographic groups considered. However, differences between the predictors of burnout among respondents in dual- and single-earner households and parents and childless respondents suggest that the demographic profile of the workforce must be considered when devising strategies to prevent or treat burnout. The increasing diversity of the working population may require that multiple intervention strategies be developed to meet the needs of employees with different demographic characteristics.

Limitations and Future Research

The study reported in this paper was cross-sectional. Cross-sectional designs are limited in their ability to establish causal relationships between variables. This means that, while the study revealed associations between work and family characteristics and burnout, uncertainty as to the direction of these relationships remains. A longitudinal study is underway to overcome this limitation. This longitudinal study will also explore the process by which burnout occurs. Research suggests that the burnout dimensions do not occur simultaneously but that there is a developmental progression over time (Cordes et al. 1997; Van Dierendonck et al. 2001). Leiter and Maslach (1988) argue that emotional exhaustion results from overload and, in an attempt to cope, individuals become withdrawn and cynical. This leads to a deterioration in performance which results in lowered sense of personal efficacy. An alternative sequence is proposed by Golembiewski et al. (1986) who suggest that cynicism develops first followed by a reduced sense of accomplishment. Finally, individuals become emotionally exhausted because they do not enjoy successes in their endeavours. The temporal sequence of the burnout stages is unresolved. It is important to understand the burnout process in order to develop early detection and treatment measures. Finally, the study will explore the mechanism by which professional and managerial construction industry employees in dual-earner households experience burnout and transmit this burnout between spouses or partners. The focus of the study is on the process that couples undergo when both are faced with a stressful work situation and demands associated with participation in a dual-income household.

Future research could also examine burnout among other engineering disciplines, such as mechanical, electrical, or chemical engineering. This would establish whether the construction industry possesses unique characteristics that pose a high burnout risk to professionals.

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