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Work-family conflict in construction: The case for a finer grained analysis

Abstract

A multi-dimensional work-family conflict (WFC) scale was tested using a sample of 169 workers in the Australian construction industry. The construction sample showed higher mean score for time-, strain- and behaviour-based work-interference with family (WIF) than scores reported in international studies that have used the multi-dimensional scale. Waged construction workers, who work on site in direct construction activity, reported higher levels of time- and strain-based WIF than salaried workers, who work predominantly in office-based roles. Mean levels family-interference with work (FIW) in the construction sample were generally comparable to levels reported in previous research. A principal components analysis revealed four clear dimensions of WFC. These dimensions were significantly correlated with other variables of theoretical relevance indicating acceptable criterion validity. The experience of WIF varied by workers' employment situation, sex and work location, while the experience of FIW varied by workers' age. The results suggest that the use of global measures of WFC might mask important differences in construction workers' experiences at the work-family interface.

Keywords

Work-family conflict, time-based, behaviour-based, strain-based conflict. Family interference with work, work interference with family

Introduction

Work-family conflict

Work-family conflict (WFC) has been defined as “a form of interrole conflict in which role pressures from the work and family domains are mutually incompatible in some respect” (Greenhaus & Beutell, 1985, p. 77). WFC has been consistently linked to negative outcomes for individuals, families and employing organisations. For example, work interference with family has been associated with job dissatisfaction, life dissatisfaction, intention to turnover, general well-being, psychological strain, psychiatric disorders, substance abuse and problem drinking (Netemeyer, Boles & McMurrian, 1996; Boyar, Maertz, Pearson & Keough, 2003; O'Driscoll, Poelmans, Kalliath, Allen, Cooper, & Sanchez, 2003; Grant-Vallone & Donaldson, 2001; Hammer, Saksvik, Nytrø, Torvatn & Bayazit 2004; Frone, 2000; Grzywacz & Marks, 2000; Allen, Herts, Bruck & Sutton, 2000).

Research in the Australian construction industry revealed that project-based construction workers experience high levels of WFC, which is predicted by excessive job demands, including long and irregular work hours (Lingard & Francis, 2004). The Australian research also revealed that WFC acts as the linking mechanism between work schedule demands and employee burnout (Lingard & Francis 2005) and that certain job characteristics, including supervisor support, moderate the relationship between WFC on employee burnout (Lingard & Francis, 2006).

Researchers distinguish between two directions of WFC: work interfering with family life (WIF), and family interfering with work life (FIW) (Mesmer-Magnus & Viswesvaran, 2005). These two directions of WFC have been found to be related but distinct concepts with unique and different sources and outcomes in the work and family environments (Brough, O'Driscoll & Kalliath 2005). Frone, Yardley & Markel (1997) tested a model of the work-family interface in which WFC was theoretically positioned as a key variable, linking experiences in the work domain with experiences in the family domain. Their results suggest that work stressors adversely affect family role performance (and vice versa) through employees' subjective experience of WFC. Frone *et al.* (1997) also report that predictors of both directions of WFC are domain-specific, i.e. stressors in the work environment (work overload and work distress) predict WIF, while stressors in the family domain (family distress and parental overload) predict FIW. Frone *et al.* (1997) also suggested home domain-specific outcomes, for FIW and WIF. Research by Lingard & Francis (2007) in the Australian construction industry supports the theory that WFC is a linking mechanism between work and family domains, but suggests different domain specific outcomes to those suggested by Frone *et al.* (1997). Whereas WIF was negatively associated with quality of family relationships (a family domain outcome), it was also negatively correlated with job satisfaction

and organizational commitment and positively correlated with turnover intention (work domain outcomes). Lingard and Francis (2007) also reveal that, for workers in the Australian construction industry, family life is more susceptible to interference from work than work is susceptible to interference from family life.

The multi-dimensional nature of work-family conflict

Greenhaus and Beutell (1985) suggested that WFC can take three forms, as follows:

- (1) *Time-based conflict*, which occurs when time spent on activities in one role prohibits the fulfillment of responsibilities in another role;
- (2) *Behaviour-based conflict*, which occurs when behaviour in one role cannot be adjusted to be compatible with behaviour patterns in another role; and
- (3) *Strain-based conflict*, which occurs when pressures from one role interfere with fulfilling the requirements of another role.

Much previous research has ignored the multidimensionality of WFC (Bruck, Allen & Spector, 2002; Ford, Heinen & Langkamar, 2007). In particular, behaviour-based conflict is often omitted in global measures of WFC (Dierdorff & Ellington, 2008). For example, one of the most frequently used measures for WFC, a scale developed by Netemeyer, Boles and McMurrin (1996), contains items that describe time- and strain-based WIF and FIW but does not include items that adequately capture the concept of behaviour-based WFC. This is a problem for both theoretical and practical reasons. Researchers who have used multi-dimensional measures of WFC have reported different antecedents and outcomes associated with time-, strain- and behaviour-based WFC (Carlson, Kacmar & Williams, 2000). Arguably, the use of global measures of WFC has prevented researchers from examining how the different manifestations of WFC vary in terms of their relationship with outcomes of interest. There is emerging evidence to indicate considerable variation. For example, Bruck *et al.* (2002) report that behaviour-based WFC explains variability in workers' job satisfaction over and above that explained by time and strain-based conflict. Indeed, when the three dimensions of conflict were considered together, behaviour-based conflict was the only dimension that significantly predicted job satisfaction. Similarly, Janzen, Muhajarine and Kelly (2007) report strain-based, but not time-based, WIF to be related to psychological distress in a sample of Canadian police officers.

A failure to distinguish between different dimensions of WFC is likely to mask important differences that could help researchers to better understand the process by which WFC impacts upon workers at the work-family interface. Further, the use of global WFC measures can obscure subtle differences in the work-family experiences of different worker groups. For example, Madsen (2006) found that the number of children an employee has is more strongly correlated with time-based WFC than the number of hours they work, and men report significantly higher levels of behaviour-based WFC than women. Carlson, Derr & Wadsworth (2003) also report individual differences in career orientation are associated with different patterns of WFC, highlighting the importance of adopting a finer-grained analysis of the concept than permitted by uni-dimensional measures.

Aims

The aims of this research were to test a multi-dimensional model of WFC conflict in a non-random Australian construction industry sample and investigate the correlates of three dimensions of WFC advanced by Greenhaus & Beutell (1989) and operationalised by Carlson *et al.* (2000). Specifically the research sought to answer the following questions:

- (1) To what extent do construction workers distinguish between different dimensions of WFC, i.e. strain-based, time-based and behaviour-based?
- (2) Are the three dimensions of WFC differentially related to theoretically relevant antecedents and/or outcomes?
- (3) Are the dimensions of WFC experienced differently by construction workers in different demographic groups, e.g. male and female workers, workers in different family arrangements and waged and salaried workers?

Methods

Data collection

Data collection was performed using the ‘TurningPoint’ automated response system with ‘KeyPad’ hand held devices. The advantages of this system include the completeness of data and minimisation of human error in data entry (de Quiros, Lopez, Aranda-Mena, & Edwards, 2008). One hundred and sixty nine participants completed the survey. All participants were working on a large civil construction project which was utilising an alliance contract. One defining feature of alliance contracts is that participants are selected on the basis of their capability, approaches and systems as well as their commitment, chemistry and the likelihood of them delivering outstanding results (Hutchinson and Gallagher 2003). Unlike traditional selection processes, in project alliancing, participants are selected *before* a price is considered. Typically, project alliance objectives extend beyond the traditional emphasis on price, to include the ability to innovate and manage relationships within and between alliance participants.

Demographic information

Participants were asked to indicate their sex, age and the number of children they have. To distinguish between the presence of dependent and non-dependent children, participants were asked to indicate how many children they have under the age of 18 and aged 18 years or over. Participants were also asked to indicate how many hours on average they work each week.

Work-family conflict was measured using a scale developed by Carlson, Kacmar & Williams (2000). This scale comprises six subscales. Each direction of WFC (i.e., WIF and FIW) is nested within three dimensions of conflict (i.e., time-based, strain-based and behaviour-based). Each subscale comprises three items. Example items are: (i) “My work keeps me from my family activity more than I would like” (time-based WIF); (ii) “The times I spend on family responsibilities often interferes with my work responsibilities” (time-based FIW); (iii) “I am often so emotionally drained when I get home from work that it prevents me from contributing to my family” (strain-based WIF); (iv) ‘Because I am often stressed from family responsibilities I have a hard time concentrating on my work’ (strain-based FIW); (v) “Behaviour that is necessary and effective for me at work would be counterproductive at home” (behaviour-based WIF); and (vi) “The behaviours that work for me at home do not seem to be effective at work” (behaviour-based FIW). Responses were provided on a five point scale ranging from strongly disagree (1) to strongly agree (5). Owing to the fact that the sample was heterogeneous, one item was removed from the dataset prior to analysis. The wording of this item (The behaviours I perform that make me effective at work do not help me to be a better parent and spouse) suggested that respondents were partnered with children, which was not the case in the construction sample. Thus, only two behaviour-based WIF items were included in the data analysis.

Other variables (covariates) that have been theoretically or empirically linked to WFC were also measured by the survey. The covariates that were measured, the scale by which they were measured and example items taken from this scale are presented in Table 1.

Table 1: Covariates of WFC and the measurement scales used.

Covariate	Scale	No. of items	Example items	Method
Time adequacy	Van Horn, Bellis & Snyder, as cited in Moen, Kelly & Huang (2008)	12	“please indicate the frequency with which there is enough time for you to keep in shape” “please indicate the frequency with which there is enough time for you to prepare or eat health meals.”	Seven point scale ranging from one (not at all) to seven (all the time).
Control	Thomas and Ganster (1995).	7	“how much choice do you have over when you begin and end each workday or each workweek?”	Five point scale ranging from one (very little) to five (very great).

			“to what extent can you choose to do some of your work at home instead of your usual place of employment?”	
Flexibility	Hill, Hawkins, Ferris & Weitzman (2001).	2	“how much flexibility do you have in scheduling when you do your work” “I have sufficient flexibility in my job to maintain adequate work, personal and family life balance.”	Five point scale ranging from ranging from one (strongly disagree) to five (strongly agree).
Supervisor support	Items drawn from Lambert, (2000) and Thomas and Ganster, (1995)	4	“my immediate supervisor is concerned about me as a person” “my immediate supervisor would switch schedules (hours, overtime hours, vacation) to accommodate my family responsibilities”	Five point scale ranging from one (not at all) to five (all of the time).
Work schedule fit	Barnett & Brennan, as cited in Moen, Kelly & Huang (2008)	2	“taking into account your current work hours and schedule, how well is your work arrangement working for you?” “taking into account your current work hours and schedule, how well is your work arrangement working for your family or personal life?”	Seven point scale ranging from one (extremely poorly) to seven (extremely well).

In addition, the concept of *work-family enrichment* was measured using six items drawn from the National Survey of Midlife Development in the United States, as cited in Grzywacz & Marks (2000). This scale was used by Wayne, Musisca & Fleeson (2004) and Innstrand, Langballe, Espnes, Falkum, & Aasland (2008) to measure work-family facilitation and was used by Grzywacz & Butler (2005) as a measure of positive spillover between work and family, facilitation, illustrating the way in which these terms have been used interchangeably in previous research. However, the items imply a transfer of energy or behaviours that also *improve performance* in the other role (Hanson, Hammer & Colton, 2006). Thus, we refer to this as work-family enrichment in accordance with the conceptual definitions of positive work-family interaction provided by Carlson *et al.* (2006) and Wayne *et al.* (2007). Example items include “The things I do at work help me deal with personal and practical issues at home” and “Talking with someone at home helps me deal with problems at work.” Participants were asked to indicate how often they experienced these circumstances in the past year. The items were scored on a five point scale ranging from one (never) to five (all of the time).

Data analysis

Mean scores for the six dimensions of WFC (i.e., time-, strain- and behaviour-based WIF and FIW) were calculated and compared against mean scores for these six dimensions reported in previous studies. Data collected using the multi-dimensional WFC scale was analysed using a principal components analysis (PCA) with varimax rotation. PCA assumes that underlying dimensions or factors can be used to explain complex phenomena. The goal of PCA is to identify the not-directly-observable factors based on a set of observable or measurable indicators. The first step in factor analysis is to produce a correlation matrix for all variables. Variables that do not appear to be related to other variables can be identified from this matrix. The number of factors necessary to represent the data and the method for calculating them must then be determined. In PCA linear combinations of variables are formed. The first principal component is that which accounts for the largest amount of variance in the sample, the second principal component is that which accounts for the next largest amount of variance and is uncorrelated with the first and so on. Coefficients (factor loadings), that relate variables to the identified factors are calculated. The factor model can then be rotated to transform the factors and make them more interpretable. The most commonly used method for rotation is varimax rotation which seeks to minimise the number of variables that have high loadings on a factor thus permitting the factors to be differentiated from one another. Following rotation, scores for each factor can be computed for each case in a sample. These scores can then be used in further data analysis. Following the PCA, the criterion validity of the emerging WFC dimensions was determined by examining the bi-variate Pearson Product Moment correlations between the scores derived for each of the WFC factors and other theoretically relevant work and family

variables. Finally, the WFC levels of different categories of respondent were compared using paired samples t-tests and one way analyses of variance (ANOVAs).

Results

The sample

One hundred and sixty nine (169) surveys were completed. Table 2 shows the characteristics of the sample. The majority of respondents was male (n=149, 88.2%). Twenty respondents (11.8%) were female. The sample was mixed in terms of family status and age. However, older workers were not as well represented as younger workers. Forty seven respondents (27.8%) were aged 30 or younger. Fifty one respondents (30.2%) were between the ages of 31 and 40, while 48 respondents (28.4%) were between 41 and 50. Twenty two respondents (13.1%) were 51 or older. One hundred and one respondents (59.8%) indicated that they were parents, while 68 (40.2%) were child-free. The majority of respondents (n=128, 75.7%) were partnered and 41 (24.3%) were single. The modal number of children under the age of 18 was two, with 37 respondents (21.9%) indicating they have two children under the age of 18. Another 22 respondents (33%) indicated they have one dependent child. The sample was split fairly evenly between waged and salaried workers. Eighty six respondents (50.9%) indicated they were waged and 83 (40.1%) were salaried workers. Ninety one respondents (53.8%) indicated they work on site, and a further 67 (39.6%) indicated they are based in the site office. The majority of participants (n=129, 76.3%) worked long hours, i.e. in excess of 45 hours per week. Only 10 respondents (5.9%) indicated they worked, on average, 40 hours a week or less.

Table 2: Demographic characteristics of the sample

	N	%		N	%
Sex			No. of children =>18		
Male	149	88.2	1	22	13.0
Female	20	11.8	2	14	8.3
			3	9	5.3
			4	3	1.8
Age			>4	1	.6
30 and under	47	27.8	N/A	117	69.2
31-40	51	30.2	Missing data	3	1.8
41-50	48	28.4			
51-60	18	10.7			
Over 60	4	2.4	No. of children <18		
Missing data	1	0.6	1	22	13.0
			2	37	21.9
			3		
Children			4	4	2.4
Yes	101	59.8	>4	2	1.2
No	68	40.2	N/A	91	53.8
			Missing data	1	0.6
Relationship status					
Partnered	128	75.7			
Single	41	24.3	Hours worked per week		
			<35	2	1.2
			35-40	8	4.7
Type of pay			41-45	29	17.2
Waged	86	50.9	46-50	29	17.2
Salaried	83	49.1	51-55	46	27.2
			56-60	32	18.9
Work location			61-65	12	7.1
On site	91	53.8	>65	10	5.9
Site Office	67	39.6	Missing data	1	0.6
Other	11	6.5			

WFC scores

Table 3 shows the mean WFC scores for each of the six types of WFC identified by Carlson *et al.* (2000) for the present (i.e., construction) sample compared with scores from previous research in which WFC was measured using the same scale. The construction sample showed the highest mean score for time-, strain- and behaviour-based WIF of any of the studies reported. Furthermore, waged construction workers, who work exclusively on site in direct construction activity, reported higher levels of time- and strain-based WIF than salaried workers, who work predominantly in office-based roles.¹ Mean levels of time-, strain- and behaviour-based FIW reported by the construction sample were generally comparable to mean levels of FIW reported in previous research.

¹ In the Australian construction industry workers can be classed as waged or salaried, based upon their employment terms and conditions. Salaried workers are managerial, administrative or professional workers who work for the majority of their time in an office environment. Waged workers are blue collar workers who work for the majority of their time on site engaged directly in construction work. These two groups are mutually exclusive.

Table 3: Comparison of WFC scores with other studies

Author	Industry/sample	Mean Time-based WIF		Mean Time-based FIW		Mean Strain-based WIF		Mean Strain-based FIW		Mean Behaviour-based WIF		Mean Behaviour-based FIW	
Present study	Construction workers in Australia	Salaried	3.16	Salaried	2.18	Salaried	3.21	Salaried	2.07	Salaried	3.13	Salaried	2.93
		Waged	3.64	Waged	2.34	Waged	3.35	Waged	2.34	Waged	3.04	Waged	3.04
Carlson <i>et al.</i> (2000)	Graduates from MBA programme in USA	Males	2.91	Males	1.77	Males	2.45	Males	1.71	Males	2.43	Males	2.36
		Females	2.82	Females	2.01	Females	2.81	Females	1.93	Females	2.63	Females	2.65
Bruck <i>et al.</i> (2002)	Hospital workers in USA		2.70		2.27		3.04		2.09		2.65		2.62
Carlson <i>et al.</i> (2003)	Graduates from MBA programme in USA		3.02		1.99		2.81		1.82		2.51		2.53
Madsen (2006) ¹	Multiple for profit organizations in USA			Teleworkers	2.21			Teleworkers	2.01			Teleworkers	2.32
				Non-teleworkers	2.25			Non-teleworkers	2.42			Non-teleworkers	2.55
Van Daalen <i>et al.</i> (2006) ²	Various industries in the Netherlands		2.42		1.89		2.24		1.68		-		-

1. Madsen (2006) did not provide mean scores separately for the two directions of time-, strain- and behaviour-based WFC, instead providing the mean score for both directions of the three WFC dimensions for teleworkers and non-teleworkers.
2. Van Daalen *et al.* (2006) reported only time- and strain-based WFC.

Principal components analysis

The PCA did not yield a six factor structure, representing the six dimensions of time- strain- and behaviour based WIF and FIW suggested by Carlson *et al.* (2000). Indeed, inspection of the scree plot suggested a four factor solution, which was supported by an unconstrained PCA with varimax rotation. The rotated components matrix is shown in Table 4, which also shows the subscale to which Carlson *et al.* (2000) suggest each item should belong (in italics). Notwithstanding the failure to replicate Carlson *et al.*'s (2000) six factor structure, an examination of the items loading on each of the factors yielded by the PCA indicates that the Australian construction workers in this sample do discriminate between the type and direction of WFC. Time- and strain-based WIF items loaded together on the first factor (explaining most of the variance). Strain-based family interference with work items loaded clearly and consistently on the second factor. All of the behaviour-based WFC (i.e. those describing behaviour-based WIF and FIW) loaded on the third factor, while time-based FIW items clearly loaded on the fourth factor. All item loadings were in excess of .50 and there was no double-loading of items. The four factor solution explained 60.57% of the variance and the alpha coefficients were .870 for Factor 1, .819 for Factor 2, .598 for Factor 3 and .728 for Factor 4.

Table 4: Rotated component matrix for the work-family conflict items

	<i>Theoretical component</i>	Principal Component			
		1	2	3	4
When I get home from work I am often too frazzled to participate in family activities/ responsibilities.	<i>Strain-based WIF</i>	.821	.039	.151	.095
I have to miss family activities due to the amount of time I must spend on work responsibilities.	<i>Time-based WIF</i>	.795	-.176	.068	.190
The time I must devote to my job keeps me from participating equally in household responsibilities and activities.	<i>Time-based WIF</i>	.783	.009	.053	.019
I am often so emotionally drained when I get home from work that it prevents me from contributing to my family.	<i>Strain-based WIF</i>	.765	.290	.138	.070
Due to all the pressures at work, sometimes when I come home I am too stressed to do the things I enjoy.	<i>Strain-based WIF</i>	.711	.252	.089	-.050
My work keeps me from my family activities more than I would like.	<i>Time-based WIF</i>	.677	-.023	.056	.008
Because I am often stressed from family responsibilities, I have a hard time concentrating on my work.	<i>Strain-based FIW</i>	.077	.856	-.019	.196
Tension and anxiety from my family life often weakens my ability to do my job.	<i>Strain-based FIW</i>	.067	.788	.105	.232
Due to stress at home, I am often preoccupied with family matters at work.	<i>Strain-based FIW</i>	.039	.718	.070	.333
Behavior that is effective and necessary for me at home would be counterproductive at work.	<i>Behavior-based FIW</i>	-.013	.051	.759	.087
The behaviors that work for me at home do not seem to be effective at work.	<i>Behavior-based FIW</i>	.146	.216	.678	-.100
The problem-solving behaviors I use in my job are not effective in resolving problems at home.	<i>Behavior-based WIF</i>	.043	-.150	.646	.254
Behavior that is effective and necessary for me at work would be	<i>Behavior-</i>	.129	-.111	.642	-.115

counterproductive at home.	<i>based WIF</i>				
The problem-solving behavior that work for me at home does not seem to be as useful at work.	<i>Behavior-based FIW</i>	.168	.286	.555	.014
The time I spend with my family often causes me not to spend time in activities at work that could be helpful to my career.	<i>Time-based FIW</i>	-.018	.195	.108	.810
I have to miss work activities due to the amount of time I must spend on family responsibilities.	<i>Time-based FIW</i>	.021	.287	.017	.747
The time I spend on family responsibilities often interfere with my work responsibilities.	<i>Time-based FIW</i>	.276	.221	-.073	.674

NB: **FIW denotes family interference with work**
 WIF denotes work interference with family

Criterion validity

The criterion validity of the multi-dimensional WFC measure was explored by examining how the WFC dimensions identified through the PCA are correlated with other theoretically relevant variables. Table 5 shows the bivariate correlations between the WFC dimensions and various work and family variables included in the survey. Of the demographic variables, time- and strain-based WIF was significantly correlated with sex ($r = -.209, p = .011$) and the number of children under 18 years old ($r = -.179, p = .030$). Work-related correlates of time and strain-based WIF include hours worked each week ($r = .279, p = .001$), supervisor support ($r = -.415, p = .000$), perceptions of work=schedule fit ($r = -.663, p = .000$), time adequacy ($r = -.561, p = .000$), control ($r = -.570, p = .000$) and flexibility ($r = -.667, p = .000$). Time and strain-based WIF was also negatively correlated with family-to-work enrichment ($r = -.248, p = .003$) and work-to-family enrichment ($r = -.290, p = .000$). Strain-based FIW was correlated with hours worked each week ($r = -.199, p = .016$), supervisor support ($r = -.208, p = .013$) and family-to-work enrichment ($r = -.263, p = .002$). Behaviour-based WIF and FIW (which emerged as a single factor in the PCA) was correlated with supervisory support ($r = -.180, p = .031$), work-to-family enrichment ($r = -.307, p = .000$) and time adequacy ($r = -.191, p = .022$). Time-based FIW was only correlated with number of children under the age of 18 ($r = -.222, p = .007$).

Table 5: Bi-variate correlations between WFC and work and family variables

	1	2	3.	4	5.	6.	7.	8	9	10	11	12	13	14	15	16
1. Age	1	-.188*	-.254**	-.600**	.014	-.043	-.147	.008	.126	.172*	.198*	-.097	.061	.221**	.073	.162*
2. Sex	-.188*	1	.064	-.001	-.235**	-.209*	.123	.016	-.090	.087	.128	.112	-.038	.043	.134	.070
3. Number of children <18	-.254**	.064	1	.156*	-.012	-.179*	-.023	-.105	-	.164*	.071	.118	.064	.229**	.229**	.228**
4. Children 18 or over	-.600**	-.001	.156*	1	.093	.065	.030	-.079	-.054	-.128	-.143	.061	-.030	-.128	-.077	-.158**
5. Hours worked per week	.014	-.235**	-.012	.093	1	.279**	-.199*	.051	-.082	.004	-.142	-.083	.016	-.135	-.286**	-.285**
6. Time & strain-based WIF	-.043	-.209*	-.179*	.065	.279**	1	-.041	.015	-.002	-.415**	-.663**	-.248**	-.290**	-.561**	-.570**	-.667**
7. Strain-based FIW	-.147	.123	-.023	.030	-.199*	-.041	1	-.074	-.005	-.208*	-.020	-.263**	-.041	.033	-.006	-.024
8. Behaviour-based WIF & FIW	.008	.016	-.105	-.079	.051	.015	-.074	1	.029	-.180*	-.107	-.142	-.307**	-.191*	-.123	-.115
9. Time-based FIW	.126	-.090	-.222**	-.054	-.082	-.002	-.005	.029	1	-.108	.086	-.090	.089	-.044	-.151	-.035
10. Supervisory support	.172*	.087	.164*	-.128	.004	-.415**	-.208*	-.180*	-.108	1	.332**	.354**	.311**	.457**	.466**	.514**
11. Work-schedule fit	.198*	.128	.071	-.143	-.142	-.663**	-.020	-.107	.086	.332**	1	.306**	.404**	.569**	.430**	.609**
12. Family-to-work enrichment	-.097	.112	.118	.061	-.083	-.248**	-.263**	-.142	-.090	.354**	.306**	1	.264**	.294**	.252**	.340**
13. Work-to-family enrichment	.061	-.038	.064	-.030	.016	-.290**	-.041	-.307**	.089	.311**	.404**	.264**	1	.373**	.262**	.348**
14. Time adequacy	.221**	.043	.229**	-.128	-.135	-.561**	.033	-.191*	-.044	.457**	.569**	.294**	.373**	1	.495**	.592**
15. Control	.073	.134	.229**	-.077	-.286**	-.570**	-.006	-.123	-.151	.466**	.430**	.252**	.262**	.495**	1	.793**
16. Flexibility	.162*	.070	.228**	-.158*	-.285**	-.667**	-.024	-.115	-.035	.514**	.609**	.340**	.348**	.592**	.793**	1

** correlation is significant at the 0.01 level

* correlation is significant at the 0.05 level

Mean WFC scores

Figure 1 shows respondents' average levels of the four dimensions of WFC by respondents' sex. Male respondents reported significantly higher levels of time- and strain-based WIF than female respondents. The mean score for men was 3.13, while the mean score for women was 2.76 ($t=2.189$, $p=.038$). Males and females did not report significantly different levels of strain-based FIW, behaviour-based WIF and FIW or time-based FIW.

Figure 1: WFC by sex

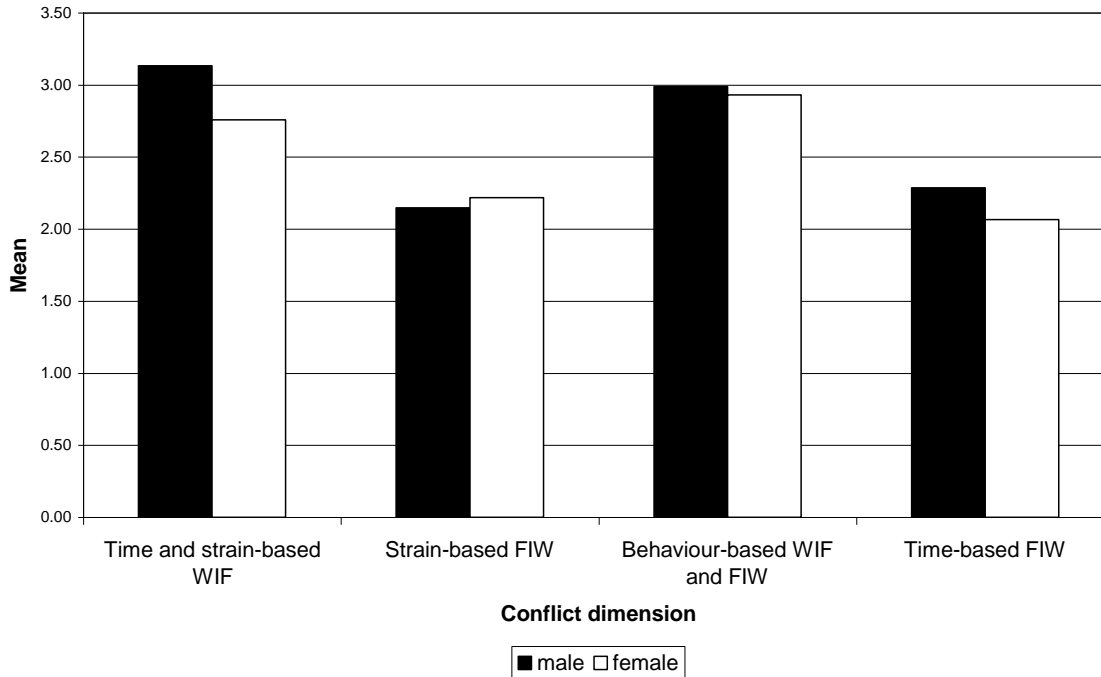


Figure 2 shows respondents' average levels of the four dimensions of WFC by their employment status (e.g. whether they are salaried or waged). Waged workers report significantly higher levels of time-and strain-based WIF (mean=3.21) than salaried workers (mean=2.95; $t=-2.10$, $p=.037$). Waged and salaried workers did not report significantly different levels of strain-based FIW, behaviour-based WIF and FIW or time-based FIW.

Figure 2: WFC by employment status

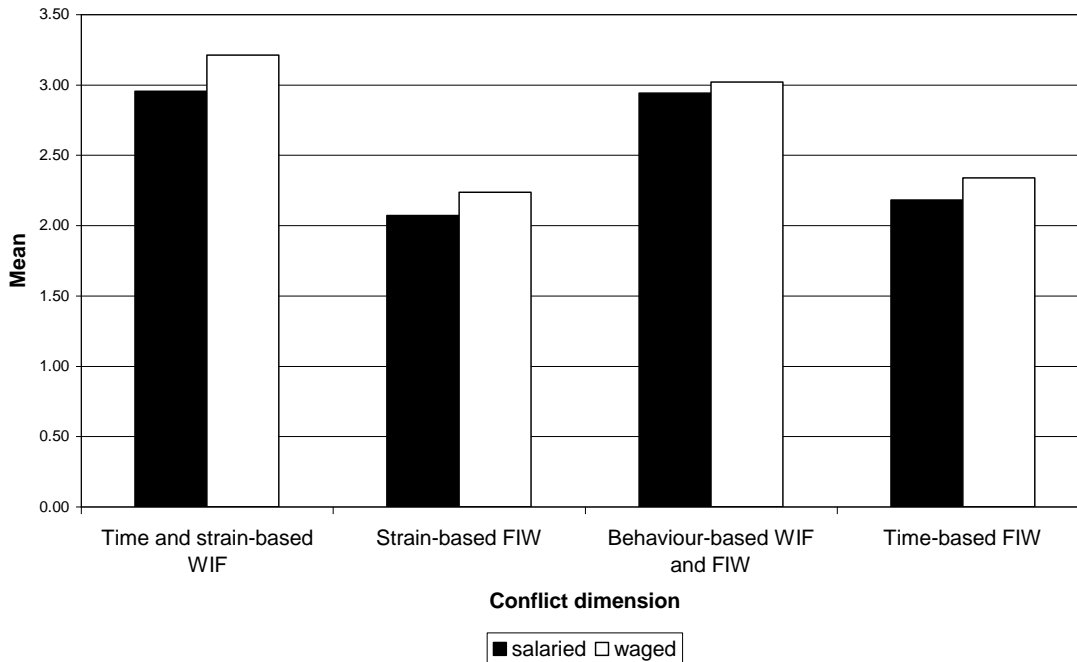


Figure 3 shows respondents' average levels of the four dimensions of WFC by their work location (e.g. whether they work predominantly in the site office or on-site engaged directly in construction work). Respondents who work on site in direct construction activity reported higher levels of all facets of work-family conflict than workers who work in the site office. However this difference was only statistically significant in the case of time- and strain-based WIF ($F=5.652, p=.004$).

Figure 3: WFC by work location

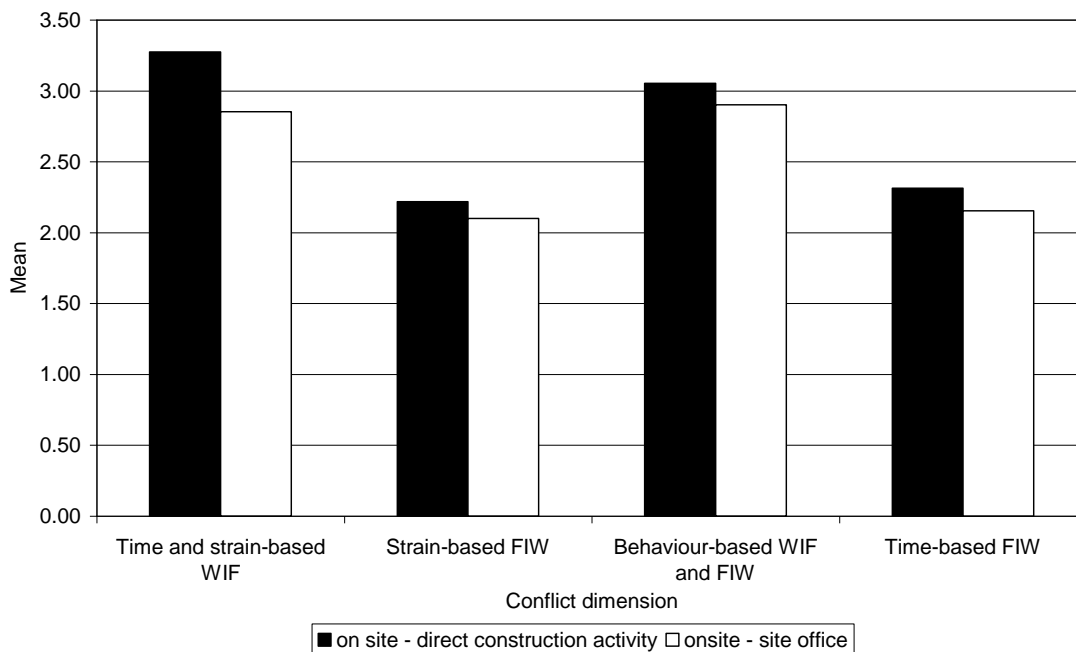
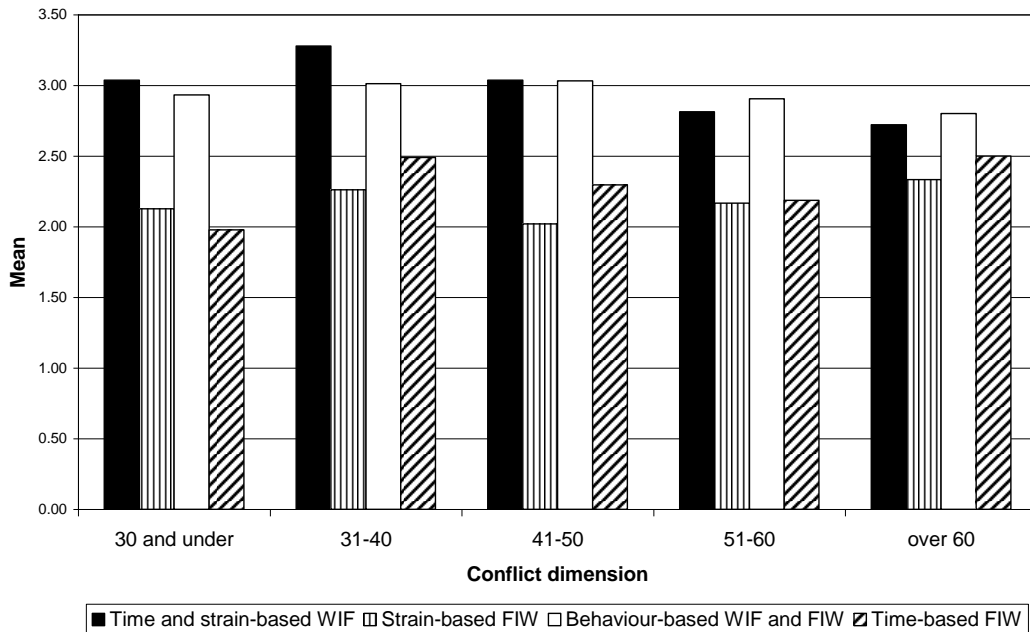


Figure 4 shows how respondents' average levels of the four WFC dimensions varied by age group. Workers in different age groups reported significantly different levels of time-based FIW, with workers aged 30 years or younger reporting significantly lower levels of this type of conflict ($F=2.93, p=.022$).

Figure 4: WFC by age



Discussion

The experience of WFC in construction

The average WIF conflict scores for the present sample of Australian construction workers were relatively high compared to the WFC levels reported in international studies that have used the WFC scale developed by Carlson *et. al.* (2000). Our results reveal important differences in the way that worker groups experience the WFC dimensions. The high levels of time- and strain-based WIF experienced by male workers, waged workers and workers engaged in site-based work in direct construction activity is of concern. The work-family experiences of these workers are not well understood, since most previous research has focused on white collar construction workers. Approximately half of the present sample was waged (rather than salaried) and, thus the findings shed new light on the magnitude of WFC in this group of workers. This is a cause of concern as research shows a strong and consistent linkage between WIF and workers' health and health-related behaviours (e.g. problem drinking, unhealthy eating habits and a lack of exercise). In Australia, comprehensive workforce health statistics are not routinely collected. However, a national telephone survey of 16,304 Australian workers conducted between 1998-2001 revealed that a large proportion of Australian workers rate their health to be sub-optimal (Korda, Strazdins, Broom, & Lim, 2002.). In this sample, male, blue-collar workers rated their health particularly poorly compared to other groups. These differences persisted after controlling for confounding variables including age, smoking and employment intensity (Korda *et al.* 2002). It is very important that the implications of high levels of WIF and opportunities for the mitigation of WIF in blue collar construction workers be the subject of future research. There is emerging evidence indicating that work-life strategies that are preferred by salaried (i.e. office based, managerial or professional) construction industry workers are not preferred by waged (i.e. blue collar) construction workers, especially as these relate to the adoption of alternative work schedules (Lingard, Townsend, Bradley & Brown, 2008). While salaried workers prefer a reduction in weekly work hours and/or the elimination of Saturday work, these initiatives potentially reduce the weekly take-home pay of waged workers who are paid higher rates for hours worked above a weekly standard number of hours and work performed at the weekend. Given the significantly high levels of time- and strain-

based WIF experienced by blue collar construction workers, it is imperative that future research examine in more detail the antecedents and consequences of WIF among this group in order to provide a greater depth of understanding upon which targeted work-family interventions can be developed.

The structure of WFC

Discriminant validity refers to the principle that indicators for different concepts should not be so highly correlated that 'conceptual overlap' is a problem. Where indicators intended to measure one concept are highly correlated with indicators intended to measure another concept, discriminant validity is low and it is concluded that the indicators do not discriminate between the two concepts, i.e. they measure the same thing. The PCA techniques used to analyse the WFC scores can help to ascertain the discriminant validity of the WFC sub-scales. The results of the PCA support the argument that WFC is a multi-dimensional construct but the six factor structure proposed by Carlson *et al.* (2000) was not replicated. Instead, a four factor structure emerged, indicating that respondents did not differentiate between time- and strain-based WIF. Also the PCA suggests that behaviour-based WFC is a uni-directional construct in that respondents failed to discriminate between behaviour-based WIF and FIW. The results of the PCA revealed that all of the survey questions, loaded very clearly on only one of the four factors. The clarity of the four factor solution suggests that the four WFC dimensions are conceptually different, indicating good discriminant validity. Given the relatively small sample used to conduct this analysis, it is important that the factor structure of the multi-dimensional WFC scale be further tested in future research in the construction industry.

Criterion validity

We assessed the criterion-related validity of the WFC scale by examining the bivariate correlations between the WFC dimensions that emerged from the PCA and a number of other work and family constructs theorized to be related to perceptions of WFC. Significant correlations between theoretically relevant variables and the construct of interest have been suggested to be an indication of the criterion-related validity of new constructs (Hinkin, 1998). In the present study, the additional measured variables were respondents' age, sex and the number of children they have, hours worked each week, supervisory support, perceptions of work-schedule fit, time adequacy, control and flexibility and work-to-family and family-to-work enrichment.

The number of children is a surrogate measure of demands in the family domain. The number of hours worked each week is a type of job demand and is indicative of an employee's objective workload. It was expected that hours worked would be positively correlated with WIF. It was expected that the number of children would be positively correlated with aspects of FIW. Work-schedule fit, time adequacy, control and flexibility are job characteristics that reflect the extent to which a person's job is able to provide a good fit with the fulfilment of requirements or expectations in non-work life (Moen *et al.* 2008). It was expected that these job characteristics would be negatively correlated with aspects of WIF. Supervisory support has also been identified as a significant direct predictor of lower levels of WIF (Seiger & Weise, 2009) and was expected to be negatively correlated with WIF in the present study. Work-to-family and family-to-work enrichment is defined as 'the extent to which experiences in one role improves the quality of life in the other role' (Greenhaus & Powell, 2006, p.73). It was expected that work-family enrichment would be negatively correlated with WFC.

Consistent with expectations, work domain variables were strongly correlated with time-and strain-based WIF. Time- and strain-based WIF was positively correlated with hours worked per week and negatively correlated with perceptions of supervisor support, work-schedule fit, time adequacy, control and flexibility. Time- and strain-based WIF was also strongly correlated with work-to-family enrichment and family-to-work enrichment. These correlations were all strong and in the expected direction. Strain-based FIW was weakly correlated with supervisor support and moderately correlated with family-to-work enrichment. Both of these correlations were negative and therefore in the expected direction. Few significant correlations were found between behaviour-based work-family conflict and the other variables of theoretical relevance. Contrary to expectation the number of children under 18 was strongly negatively correlated with time-based FIW. This finding might be due to the

fact that the sample comprised mainly of males who may be in 'traditional' family arrangements in which their female partners are not in paid employment or work only part time.

These results suggest a degree of criterion validity, especially in relation to time- and strain-based WIF. It is unsurprising that relatively few significant correlations were found between the dimensions of FIW and the variables included in the survey because (with the exception of the number of children) these were work domain variables. The domain specificity of antecedents of WFC in previous studies (Frone *et al.*, 1997; Michel *et al.* 2009), would suggest that work domain variables would not be strong correlates of FIW. The fact that family-to-work enrichment but not work-to-family enrichment was negatively correlated with strain-based FIW does support the criterion validity of this WFC dimension.

Conclusions

The results have important implications for research and practice. They suggest WFC is best treated as a multi-dimensional construct because the four dimensions of WFC were correlated with other theoretically relevant work and family variables in different ways. Specifically, time and strain-based WIF was predicted by a number of work-related variables, including perceptions of work schedule 'fit', control and flexibility that did not predict other dimensions of WFC, while supervisory support was a significant predictor of time and strain-based WIF, strain-based FIW and behaviour-based WIF and FIW. Future research should adopt a more fine-grained approach to the measurement and analysis of WFC because understanding how the different dimensions of WFC are related to work and family circumstances can inform the development and evaluation of strategies and interventions to alleviate WFC. Our results reveal that the experience of the WFC dimensions varied by age, sex and employment arrangement (e.g. whether someone is waged or salaried). Waged workers suffered higher levels of time and strain-based WIF than salaried workers and employees under the age of 30 reported lower levels of FIW. The use of uni-dimensional WFC measures is likely to obscure important differences in the way in which worker groups in the construction industry experience WFC. The high levels of time- and strain-based WIF reported by the construction sample, relative to levels reported in other studies, highlight the magnitude of the problem. While our results are consistent with the findings of previous researchers who have found that workplace supports, such as supervisor support, flexibility and control, are important factors in alleviating WFC more research in the construction industry is required to examine the extent to which the WFC of different worker groups can be reduced through the provision of these types of support.

Limitations and future research

The research had some significant limitations. First, due to the fact that the sample for this analysis was drawn from a single, albeit large, construction project in Melbourne, it is not possible to generalize the findings to the population of construction workers in Australia. More research is needed using random sampling and larger sample sizes to determine to what extent the findings are generalizable. Second, the research provides limited information about the correlates of FIW, partly because few family-domain variables were included in the survey. This research was undertaken as a baseline survey in a larger research project in which work-family supports will be designed, implemented and evaluated in a number of case study construction projects. Thus, the focus was on the impact of workplace factors in shaping work-family experiences. Future research should investigate the relationship between family-domain variables, such as family time demands and family social support on FIW.

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