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WORKPLACE BULLYING: MODELLING CONSTRUCT VALIDITY IN AN AUSTRALIAN PUBLIC SECTOR WORKFORCE

Joanne Bradbury[1†] --- Marie Hutchinson[2]

[1]*Lecturer and Research Fellow, School of Health and Human Sciences, Southern Cross University, Australia*

[2]*Associate Professor of Nursing, School of Health and Human Sciences, Southern Cross University, Australia*

ABSTRACT

Background: Measuring workplace bullying is a challenge as different workforces have different issues. Objectives: The aim of this study was to evaluate the construct validity and reliability of a Workplace Bullying Inventory (WBI) that was originally derived and validated in a nursing workforce in a broader sample of the Australian public sector workforce. Method: A two-stage procedure was employed with a large sample of volunteer public sector workforce union members (n=1,508), randomly split in two halves. The first sample (n=754) was analysed using exploratory factor analysis (EFA) and the second sample (n=754) through confirmatory factor analysis (CFA) using MPlus. The WBI consisted of 20 items related to bullying behaviours; 17 of which we had previously validated for use in an Australian nursing workforce. An additional 3 items were included from other workforce bullying scales in order to enhance the generalizability of the scale to a wider workforce. Results: The final model, identified in sample 1 and validated in sample 2 (CFA), best represented workplace bullying as three reliable first-order factors, together loading 13 items; Social Intimidation with 6 items (α = 0.88), Personal Attack with 4 (α = 0.84) and Attack through Work Tasks with 3 items (α= 0.85). Discussion: The modelling demonstrates that workplace bullying is a complex construct, consisting of multiple factors. The original measure derived from the nursing workforce demonstrates broad applicability in different public sector workforce contexts. Differences in the factor structure of the WB construct in this study when compared to the earlier nursing study suggest subtle differences may exist in the nature of bullying across workgroup settings. Future work in theory development should investigate further the complexities of the construct in order to learn how to manage and ultimately prevent WB behaviours.

Keywords: Workplace bullying, Construct validity, Horizontal violence, Lateral violence.

† Corresponding author

Contribution/ Originality

This study contributes in the existing literature on workplace bullying by testing measures of the construct in the broader public sector workforce. It is one of very few studies to have established the construct validity of measures designed for the nursing workforce across a range of workforce settings.

1. INTRODUCTION

Bullying in the workplace is endemic and costly. Although reported prevalence rates vary across studies, most research suggests in the order of 10-20% of the workforce are exposed annually (Lutgen-Sandvik *et al.*, 2007; Hutchinson *et al.*, 2010), with nursing considered a high-risk setting. For individuals the experience is traumatic and devastating, with harassment and bullying the largest contributor to mental stress in the workplace after work pressure (Yildirim, 2009; Incidence of Accepted Workers' Compensation Claims for Mental Stress in Australia, 2013).

In a recent review of two meta-analyses, which included 66 samples from 54 cross-sectional + 27 longitudinal studies (n=77,721; combined N = 140,637), Nielsen and Einarsen (2012) concluded that there is strong evidence that workplace bullying (WB) is significantly associated with mental health and job satisfaction outcomes. The analysis noted that WB was significantly associated with anxiety (r= 0.27), depression (r= 0.34), post-traumatic stress (r= 0.37), strain (r= 0.31), somatization (r= 0.28), burnout (r= 0.27) and physical health problems (r= 0.23) (all p <0.001). In terms of job-related outcomes, WB was directly associated with intention to leave (r= 0.28) and absenteeism (r= 0.11) and was inversely associated with job satisfaction (r= -0.22) and organisational commitment (r= -0.19) (all p <0.001). There was no significant relationship between WB and work performance (r=-0.12, p>0.05) but this was based on only three studies. While these effect sizes are consistent across a range of indicators and provide a clear picture of the impact of WB on both personal and professional health and wellbeing, interpretations of these aggregate data are limited by the inclusion of a large number of cross-sectional studies.

It is now also widely recognised that WB not only harms individuals, it also has widespread flow-on effects within work teams and across entire organisations and industry sectors (Hutchinson *et al.*, 2008; Einarsen *et al.*, 2011). Reflecting the degree of concern about WB, the Australian Productivity Commission estimated the cost to the Australian economy, including hidden and lost opportunity costs, is $17 - 36 billion, with 1.5 million workers exposed annually *(Performance Benchmarking of Australian Business Regulation, 2010)*. The corresponding costs to the American economy are estimated up to $43.4 billion each year (Indvik, 2012).

Due to the wide variation in definitions used by researchers as to what behaviours actually constitute bullying and the varying nomenclature it is difficult to estimate with accuracy prevalence and incidence rates. In 2007, the prevalence of workplace bullying in the US was estimated at 28% in an online sample drawn widely across American workplaces (n=403)

(Lutgen-Sandvik *et al.*, 2007). In 2010, the Australian Productivity commission used an average of US (21.5%) and UK (10%) prevalence data to estimate Australian prevalence (approximately 15%) (Performance Benchmarking of Australian Business Regulation, 2010). However, these are not accurate estimates; rather, they are based on a rough average of estimates from other countries with similar work cultures. Further, there are discrepancies in the reported prevalences within the US (28% versus 21.5%), which highlight measurement issues relating to construct definition.

1.1. Defining and Measuring Workplace Bullying

Workplace bullying is a relatively new construct, dating back to the 1980s (Leymann, 1990). While there has been considerable research in the field of WB over the last decade, measurement of the theoretical construct is as yet in its infancy, and problems remain with the construct definition and specification of WB, with uncertainty about its measurement and legal implementation.

Workplace bullying has been conceptualised as a form of negative or hostile behaviour perpetrated by individuals or work groups. Most definitions emphasise duration and persistency of exposure (Leymann, 1996; Zapf, 1999; Einarsen *et al.*, 2003), with the resultant power imbalance making it difficult for targets to defend themselves against the behaviours, which sustains a negative spiral of hostility and defencelessness (Einarsen *et al.*, 2003). The conceptual problems in defining the behaviours that constitute bullying are made more difficult by the blurred boundaries with similar constructs such as harassment, incivility, aggression, hostility, negativity, intimidation, disruptive behaviour, counter-productive behaviours, or other poor social behaviours in the workplace (Caponecchia and Wyatt, 2009). While these behaviours, or aspects of these behaviours, may indeed constitute bullying, a temporal component of the construct is critical. In everyday language, most people would probably understand bullying as feeling exposed to ongoing or repetitive, unwanted behaviours from superiors or colleagues, which the person feels they have insufficient control to stop. Reflecting emerging international consensus, we use the term bullying to incorporate behaviours that have been variously termed harassment, lateral and horizontal violence or mobbing in the nursing literature (Vessey *et al.*, 2011)

Importantly, there are both theoretical and operational definitions of WB referred to in the literature. Some researchers use a 'self-identified' bullying indicator; that is, simply asking participants whether they had been bullied at work (Mintz-Binder and Calkiuns, 2012). While simple, this approach may not be accurate: Firstly, not all workers readily recognise bullying for what it is, and; secondly, for various reasons, many people do not wish to identify as a victim or perpetrator of workplace bullying. Lutgen-Sandvik *et al.* (2007) found significantly different prevalences for the same population (n=403) when asked to self-identify (n=38, 9.4%) versus responses based on exposures to a number of negative acts (>=2) on a regular basis (weekly) over the past 6 months; based on these responses bullying was then identified and quantified by the researchers (n=113, 28%) ($\chi^2(1)=9.25$, $p<0.01$). Part of the discrepancy was associated with the intensity of bullying. That is, those who self-identified with being bullied also reported a higher

exposure to negative acts. Nielsen and Einarsen (2012) refer to the former method as the 'self-victimisation' method and the latter as the 'behavioural experience' method, which asks respondents to address a range of bullying behaviours over a period of time. They have also shown that the former 'self-victimization' method under-estimates prevalence rates and urge that researchers interpret their findings according to the means by which the construct was measured.

A popular operational definition of WB that has emerged in recent literature as proposed by Leymann (1990) and measured by the Negative Acts Questionnaire (NAQ) is at least two negative acts, weekly or more often, over six or more months where the target finds it difficult to defend against the abuse (Lutgen-Sandvik *et al.*, 2007). Negative acts may include hostile communication, belittling, intimidation, humiliation, isolation, sabotage, work overload, working below competence level or excessive work monitoring. While widely utilised, the NAQ is limited in its scope to detect bullying in a number of ways, calling into question its sensitivity and predictive validity (Notelaers and Einarsen, 2013). If for example, a person is subjected to one negative act every week this would not be detected, regardless of its severity, as the minimum number for this definition is two. Also the NAQ consists of 22 items, but there is no evidence that bullying is necessarily limited to these behaviours, raising the potential for reduced sensitivity of the NAQ. For instance, the NAQ does not locate WB within workplace processes or labour processes (Lewis and Gunn, 2007) or capture the complexity of changed social relationships and power dynamics that allow for a more complex and socially situated range of behaviours (Lewis and Orford, 2005). Furthermore, the focus upon individual behaviours does not take account of the wider organisation context that may act as a mediator or moderator of the relationship between exposure to WB and how it is experienced and reported (Hutchinson *et al.*, 2008). Certain negative acts have been demonstrated to be more harmful than others (Hoel *et al.*, 2004), suggesting there is merit in assessing the degree of severity of exposure. In addition, the NAQ has only recently demonstrated construct validity (Einarsen *et al.*, 2009) and factor analytic studies of its underlying dimensionality in the nursing context report poor interpretability, calling into question the applicability of the measure in the nursing context (Abe and Henly, 2010; Simons *et al.*, 2011). In summary, although the NAQ has made a considerable contribution to the relatively young field of workplace bullying measurement, and has been used in a number of studies of nurse bullying (Simons, 2008; Johnson and Rae, 2009; Spence Laschinger *et al.*, 2010; Berry *et al.*, 2012). There remains room for improvement with regards to construct definition and measurement of WB. Accordingly in recent years attention has turned towards developing nurse-specific measures of bullying, with construct validity of these measures established through exploratory factor analysis (Hutchinson *et al.*, 2008; Oztyrjm *et al.*, 2008; Yildirim and Aytolan, 2008). To the best of our knowledge, there has been no analysis of the broader applicability of WB instruments derived in the nursing workforce. The aim of this study was to further construct validity analysis of a workplace bullying inventory developed and previously tested in the Australian nursing workplace (Hutchinson *et al.*, 2008; Hutchinson *et al.*, 2010) in the Australian public sector context.

2. METHODS

A cross-sectional survey design was used to collect data on a large sample (n=3,345) aiming to model the relationships between workplace bullying (WB) and emotional intelligence (EI), using structural equation modelling (SEM). The current paper reports the first stage of the modelling process, which involved modelling the construct of WB using factor analysis through split sample exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) to evaluate the construct validity of the WB instrument. Reliability was assessed using Chronbach's alpha. The study had the prior approval of the institutional Human Research Ethics Committee.

2.1. Instrument

The survey consisted of both self-identifying and behavioural exposure items. The self-identifying item simply asked respondents to indicate whether they were currently experiencing bullying as a yes/no categorical question. The WB behavioural exposure items on the WBI consist of 17 items on three factors: Attack upon Competence and Reputation (ACR), Personal Attack (PA), and Attack through Work Tasks (AWT). All items were included in the study; in addition, 3 items were included from the NAQ ('Insulting/offensive remarks', 'shoved or blocked' and 'practical jokes'). Whist similar items were removed from the earlier version of the WBI (following item scale and factor analysis), the three additional items were included in this study as the earlier research was undertaken in a female dominated workforce. (The 20 items for WB are listed in Table 2). Respondents were asked to rate the frequency of exposure to each of the behaviours for the preceding 12 months (1 = never to 5 = daily).

2.2. Sampling Procedure

The sample was recruited from a public sector union organisation in the state of Queensland, Australia which reportedly included approximately 39,000 members. Membership of the organisation includes administrative staff employed in public sector health services, schools, the community services, local government services, as well as general staff in universities. An email invitation to participate in the survey was forwarded to members, with the survey hosted by the independent Qualtrics software web platform for a two week period in late 2012.

A total of 3,345 completed surveys were obtained. Cases with complete data for every item on both scales (EI and WB) were included in the current study (n = 1508 or 45% of people who commenced the questionnaire). The CFA was to be conducted using SEM software, which requires a complete rectangular data set (i.e. no missing data). The decision to exclude participants with missing data was considered to be more acceptable than imputing missing data, due to the fact that the sample was large enough to accommodate such a loss of observations. Extensive comparisons between the analytic sample and those with missing data would be conducted to determine whether the exclusions introduced any apparent systematic bias.

Two random samples were generated from the survey respondents for use in the current study. The random number generator in Excel was used to assign a value for each case, the

random numbers sorted and the first half used in sample 1 (n=754) and the second half used in sample 2 (n=754). Sample 1 was used in the exploratory factor analysis (EFA) and sample 2 was used in the confirmatory factor analysis (CFA). The EFA were conducted using IBM SPSS v20 and CFA were conducted with the SEM software, MPlus v6.

2.3. Exploratory Factor Analysis

Exploratory Factor Analysis was conducted using Maximum Likelihood (ML) extraction in conjunction with an oblique rotation method (Direct Oblimin, delta = 0) to account for probable correlations among the factors (Tabachnick and Fidell, 1996). The pattern and structure matrices from the rotated solution aid in the interpretation of the factor structure. The guiding principles in the decisions for the number of factors to extract were: (i) eigenvalues > 1; (ii) inspection of the Scree plot; (iii) Parallel analysis; (iv) GOF statistical non-significance, and; (v) consideration of the proportion of significant residuals (> 0.05) in the reproduced correlation matrix (Joreskog and Moustaki, 2001).

2.4. Confirmatory Factor Analysis (CFA)

The chi-square goodness of fit (GOF) test statistic tests the null hypothesis that there is no significant difference between the structures of the population and sample covariance matrices. A significant chi-square statistic indicates a significant discrepancy and a poorly fitting model (Joreskog and Moustaki, 2001). However, as chi-square is influenced by sample size a range of fit indices are considered more robust than chi-square alone, as a more holistic approach to model fit (Froman, 2001). Important fit indices are the Root Mean Square Error of Approximation (RMSEA), particularly the 90% CI, which is the average difference between the population and sample data covariance matrices. RMSEA values < 0.08 reflect an adequate model fit. The CFI (Comparative Fit Index) and TLI (Tucker-Lewis Index) compares the estimated model with a null model. Adequate model fit is reflected by CFI/TLA values > 0.95.

2.5. Reliability and Validity

Chronbach's alpha was used to assess scale reliability in SPSS.

3. RESULTS

3.1. Characteristics of Samples

Basic demographic and employment characteristics of the sample are shown in Table 1. The sample for the combined factor analyses (n=1,508) consisted of 422 (28%) males, 1083 (72%) females, with 0.2% missing data for gender. This was comparable with the proportions from the original data(n= 3,345) before the cases with missing data were removed (25% and 62%, respectively, with 13% missing). The difference in proportions between males and females from the two datasets were non-significant, indicating that gender was not related to completion or non-completion of the survey. Other attributes also look fairly evenly distributed. Chi-square

analysis did not find any significant differences between groups in areas of work nor type of work, further suggesting that the cases with missing data that were removed prior to factor analysis were missing at random (MAR). In terms of the representativeness of the larger data sample (n=3,353) for the Australian labour force, where 45% are women and 54% are men, the working women are over-represented in the sample. However, in terms of the QLD public sector workforce, women are more prevalent than men with 67% females and 33% males (Queensland Public Service Workforce Characteristics 2011-2012, 2013); these proportions were reflected in our sample.

3.2. Preliminary Analysis

On the self-labelling question, 23.7% of the combined sample (n=1,508) reported they were currently experiencing bullying, and 61% reported having been bullied in the past, compared with 18.4% of the whole sample (n=3,343) currently bullied and 48% bullied in the past. Further, in the current sample 59% report having witnessed others being bullied compared with 48% in the whole sample. The higher proportions of people that have directly experienced bullying in the current sample perhaps correspond with a higher motivation to complete all sections of the survey.

3.3. Exploratory Factor Analysis (EFA) in First Data Set

The suitability of the strength of the correlations for factor analysis was confirmed by a significant Bartlett's Test of Sphericity ($\chi^2_{(190)}$ =3072.45, $p \leq 0.005$). The factorability of the subscales was confirmed by a high Kaiser-Meyer-Olkin Measure of Sampling = 0.94. There were three eigenvalues > 1, accounting for 63.9% of the total variance among the items, with the first factor accounting for 50.6% of the variance. The GOF statistic was significant ($\chi^2_{(133)} = 304.53$, $p \leq 0.005$). The reproduced correlation matrix indicated that 17% of the residuals were significant (> 0.05).

For the parallel analysis, comparison of the eigenvalues with those generated by a Monte Carlo principal components analysis on a randomly generated dataset of a similar size (20 variables, 754 observations, 100 replications) indicated two valid factors. The Scree plot, as given in Figure 1, indicates one clear factor, but also that there could be three distinct factors.

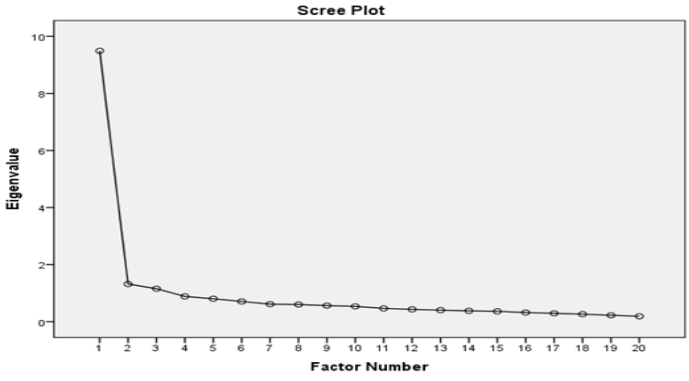

Figure-1. Scree plot for 20 items of bullying scale

The communalities for the three-factor exploratory model were inspected and items with the smallest shared variance with its latent factor within the three-factor solution were B20, B19 and B4 (all<0.25) and were removed from the scale. Two further items had communalities < 0.4 (B11 and B17) and were closely monitored. The pattern (rotated factor loadings) matrix for the three-factor solution is provided in Table 2. The pattern matrix shows that after rotation, only one item was cross-loaded onto a second factor (B9 factor loadings > 0.3 on two factors). The structure matrix confirms that Q2 had equal strength correlations with two factors (0.6s for both). Apart from this cross-loading, the pattern matrix reveals a clear factor structure for a three-factor solution.

Table-2. Pattern matrix and communalities for the three-factor exploratory solution

	Factors			Communalities	
	1	2	3	Initial	Extraction
B1 reputation damaged	0.24	-0.48	-0.21	0.60	0.60
B2 achievements ignored	0.69	-0.02	-0.20	0.62	0.63
B3 abilities questioned	0.31	-0.29	-0.50	0.67	0.75
B4 work above skill level	0.48	0.01	-0.06	0.29	0.24
B5 denied opportunities	0.66	0.02	-0.08	0.46	0.46
B6 ignored	0.59	-0.14	-0.12	0.59	0.57
B7 belittled	-0.02	-0.84	-0.13	0.71	0.76
B8 watched and followed	0.42	-0.21	-0.23	0.51	0.49
B9 blamed	0.27	-0.45	-0.31	0.67	0.70
B10 publically humiliated	-0.14	-0.95	-0.09	0.68	0.77
B11 threatened	0.29	-0.39	-0.02	0.45	0.42
B12 excessively scrutinized	0.46	-0.13	-0.46	0.64	0.68
B13 work org to isolate me	0.79	-0.01	0.13	0.54	0.59
B14 inconvenience	0.66	-0.09	-0.02	0.54	0.54
B15 excluded	0.75	-0.03	0.01	0.57	0.59
B16 demeaning work	0.76	0.06	0.09	0.44	0.48
B17 heaviest load	0.61	-0.02	0.03	0.40	0.37
B18 Insulting/offensive remarks	0.06	-0.72	-0.01	0.55	0.58
B19 shoved or blocked	0.28	-0.32	0.16	0.28	0.28
B20 practical jokes	0.06	-0.37	0.13	0.16	0.15

In the three-factor model, the highest-loading item, which was loaded onto the first factor, was B15 ('I was excluded from receiving information'), followed closely by B13 ('my work was

organised to isolate me'). The other items were B5 ('denied opportunities'), B6 ('ignored'), B2 ('achievements ignored') and B16 ('given demeaning work'). This factor was labelled Social Isolation through Work Exclusion (SOCIWE). Factor 2 contained seven, negatively loaded items, whereby B10 ('I was publically humiliated') and B7 ('I was belittled in front of others') and B18 ('insulting offensive remarks'). This construct was labelled Personal Attack (PERSATT). The highest loading item on the third factor was B12 ('my work was excessively scrutinized') and B3 ('my abilities were questioned'). This construct was labelled Attack through Work Performance (ATTWP). B9 ('I was blamed') loaded onto both Personal Attack and Work Scrutiny. Although the second and third factors contained negatively loaded items in the rotated exploratory solution, the constructs themselves were consistent with the theory in describing multi-dimensional aspects of workplace bullying. The inter-factor correlations as determined by EFA were between .48 and .71.

3.4. Confirmatory Factor Analysis (CFA) in First Data Set

The five items with very low communalities were removed (B20, B19, B17, B11 and B4) and B9 was removed as it was evenly cross-loaded onto two factors. After these six items were removed, the three-factor confirmatory model for the bullying items had a significant chi-square ($\chi^2_{(87)}$= 433.79, p =< 0.005, RMSEA = 0.073 [90%CI: 0.066, 0.080], CFI = 0.98), and as such was not considered a good fit to the data. Further exploratory modelling was conducted to fine tune the model, which included removal of B10='publically humiliated' as it had unique and significant shared variance with B7='belittled', indicating that one or the other were redundant. After excluding B10 the final model was associated with adequate model fit statistics, particularly the RMSEA and CFI ($\chi^2_{(60)}$= 169.82, p =< 0.005, RMSEA = 0.049 [90%CI: 0.041,0.058] , CFI = 0.99).

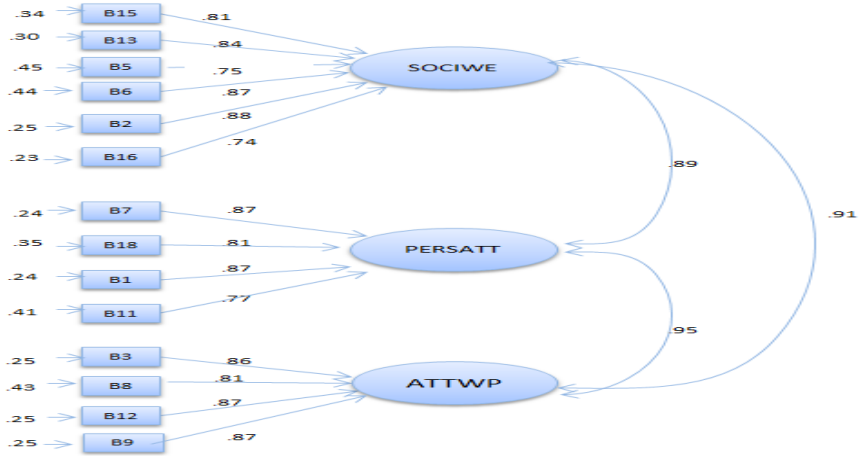

Figure-2. Three factor confirmatory model in Sample 2 (n=754)

Notes: Latent constructs are represented by ellipses; observed variables (items/indicators) are represented by rectangles. Arrows heading from indicators to constructs represent the factor loadings. Arrows pointing into the indicators (rectangles) represent error variances. The curved double-headed arrow between the constructs represents inter-factor correlations. All parameters fully standardised.

The inter-factor correlations were r = 0.84 for PERSATT with SOCIWE, r = 0.81 for ATTWP with SOCIWE, and r = 0.90 for ATTWP with PERSATT. Cronbach's alpha for the 15 items was 0.94. For the subscales: PERSATT α = 0.84; SOCIWE α = 0.88; and ATTWP α= 0.85.

3.5. Confirmatory Factor Analysis (CFA) in Second Data Set (n=754)

The 3-factor CFA model for the 13 item workforce bullying inventory was then retested in a fresh data set and is illustrated in Figure 2. It was a comparable fit to the data ($\chi^2_{(60)}$= 202.24, p =< 0.005, RMSEA = 0.056 [90%CI: 0.048, 0.065], CFI = 0.99). The inter-factor correlations were higher: r = 0.91 for PERSATT with SOCIWE, r = 0.91 for ATTWP with SOCIWE, and r = 0.94 for ATTWP with PERSATT. These high inter-factor correlations suggest that the factors may have low discriminant validity. However a one factor model was a significantly worse fit, given by the unacceptably high RMSEA ($\chi^2_{(63)}$= 589.13, p =< 0.005, RMSEA = 0.105 [90%CI: 0.098, 0.113], CFI = 0.96). Therefore the three factor model, as identified by exploratory factor analysis and confirmed with confirmatory factor analysis, was considered the best representation of the relationship structures among these items.

4. DISCUSSION

The three factor structure was the best representation of the relationships among the 13 items of the Workforce Bullying Inventory. The three factors define WB as enacted through Social Isolation and Work Exclusion; Personal Attack, and Attack through Work Performance. The three factor model was identified by exploratory factor analysis in the first sample, using exploratory factor analysis and exploratory confirmatory factor analysis and was then cross-checked and validated with fresh data from the second sample using confirmatory factor analysis. This conclusion is supported by the weight of evidence from a range of fit statistics in sample 2; particularly the RMSEA 90% confidence interval estimates demonstrating acceptable model fit with the higher limit < 0.8.

The test-retesting of the model in different data demonstrates good external reliability or generalizability of the model for the population from which the samples were derived. Good internal reliability of the three constructs was demonstrated with Cronbach alphas > 0.8. Although three distinct underlying dimensions of WB were identified, the correlations between the factors were high (average 0.86 in sample 1 and 0.92 in sample 2), suggesting poor discriminant validity. However, the one factor model was an acceptably poor model fit (RMSEA > 0.1), suggesting that there are indeed three highly-correlated but distinct factors that best represent the structural relationships among these items across samples.

Similar to the original inventory, the three underlying bullying constructs tap into forms of social isolation and work exclusion, personal-related, and work-performance mediated acts. Forms of physical intimidation (which were represented by the additional three items included for the purpose of enhancing the generalizability of the original WBI for a wider workforce in this study from the NAQ did not fit well in the current model. That is, most of the variance in these

items was not explained by the model and these items were therefore associated with large error variances. Physically intimidating forms of bullying, such as 'shoved or blocked' and 'practical jokes' did not correlate well with the other items and were not good indicators of any of the constructs identified during modelling and were consequently dropped from the scale. Forms of physical bullying were similarly found as unrepresentative in the initial Australian study from which the WBI was derived (Hutchinson *et al.*, 2008). Physical forms of WB may be gender-related and/or may be related to the type of work/industry. Women were the dominant gender in both samples where physical forms of bullying were found to be unimportant, but it would be interesting to note whether physical forms of bullying are representative of male-dominated samples.

Forms of personal attack that clustered on the second factor include tactics that publicly undermine or invalidate the worth and self-esteem of those targeted. Whilst these bullying behaviours are an attack upon the individual, they occur within the context of the work group and may serve to heighten feelings of isolation, exclusion and reduced mutual support for those targeted. Importantly, the power of these forms of personal attack comes from their public nature (Hutchinson *et al.*, 2010; Hutchinson, 2013). Within the workgroup, individuals who witness personal attack forms of bullying may label the individual targeted as a problem or withdraw social support. By enacting personal attack in front of others, and framing individuals as somehow less worthy or competent, these forms of WB may shape the perceptions of colleagues towards the targeted individual and sustain an acceptance or tolerance of bullying within the work team. Thus, this form of bullying not only undermines the self-worth of the individual, it also erodes social relationships within work teams and magnifies social isolation (Lewis and Orford, 2005). Scapegoating through personal attack may function to further reinforce the marginal position of individuals and reaffirm within the work group a sense of group conformity against those incriminated through WB (Corney, 2008). This dynamic may underlie the identified inter-factor correlations between the personal attack factor and other two factors which include work exclusion and attack through work processes, with personal-attack bullying paving the way for work-group and performance related bullying.

The original Workplace Bullying Inventory captured the commonly reported experience in nursing teams of masked forms of bullying such as invalidation, isolation from the remainder of the workgroup, exclusion from information or activities, denied opportunities, and subtle undermining through ignoring others achievements and work contributions (Yildirim and Yildirim, 2007; Shellie, 2008; Yildirim and Aytolan, 2008; Vessey *et al.*, 2009; Hutchinson *et al.*, 2010a; Hutchinson *et al.*, 2010b). It is evident from the current study that the broader Australian public sector workforce is also prone to bullying involving these forms of social isolation and work exclusion. Public sector organisations are characterised by an organisational culture quite different to business and other commercial industries. Such government institutions have unique traditions and processes that determine the workplace climate (Lynch, 2002; Estryn-Behar *et al.*, 2008; Miller and Rayner, 2012) and can influence the initiation, maintenance, and even

normalisation of WB (Dale and Acik, 2005; Hutchinson *et al.*, 2008; Hutchinson, 2013). For instance, public sector institutions are frequently characterised by heavily beaurocratised, authoritarian leadership structures (Hoel and Salin, 2003; Hutchinson and Hurley, 2013), which reduces the sense of control workers have over how they perform their work (Hoel and Beale, 2006). Increased demand for service quantity and quality together with decreasing public resources together and reductions of the individual's power to control processes (Ahmed and Brousinne, 2008) have been recognised as enabling antecedents to bullying behaviours (Baillien *et al.*, 2011). It is feasible that the social intimidation and work exclusion factor identified in our analysis is reflective of public sector culture and a more prevailing form of bullying within this context.

4.1. Methodological Limitations

In order to assess the representativeness of the sample, the attributes of those who were included were compared with those who were excluded from the analysis. Both descriptive and analytic comparison of these samples demonstrated that there were no major differences between the groups on attributes of interest, such as gender, type of work and area of work. W therefore conclude that selection bias was not introduced by the method chosen to deal with missing data. While imputation methods for dealing with missing data are improving in sophistication, with large samples (> 200) and relatively uncomplicated models, there may be little imperative to impute data. We were interested in accurately modelling construct validity for the workplace bullying inventory. We had adequate power in the sample and believed it more rigorous to include only true and accurate data, rather than to risk diluting the findings by imputing estimates that may or may not be accurate.

The representativeness of the original sample to the general working population was difficult to determine. The survey did not ask whether workers were employed full or part time, age, education or pay. These attributes could not then be compared back to the general population. Future research should consider these demographic attributes and collect data that is readily compared with the population from which the sample is derived. The proportions of females and males were reflective of the QLD public sector, however, which provides support to the notion that this sample may be representative of the QLD public sector. However the high proportion of construction workers and low proportion of health sector workers suggest that the sample may not be representative of QLD public sector workers but may be representative of the QLD public sector union membership.

The survey started with 20 items, which were reduced down to 13 representative items. There were some redundancies among the items, such as between 'belittled' and 'humiliated', for which the most representative item was kept and the item with the lower correlation with the other items and factors were withdrawn from analyses. The withdrawal of some of the items, such as the physical bullying items, that were not relevant in our population, may yet be relevant in male-dominated or physically-dominant industries, and should perhaps be included in scales

seeking to assess the impact of bullying in a national probability sample. Future work in scale development should also include items to assess the impact of organisational culture on bullying.

5. CONCLUSIONS

The three-factor structure refined through our analysis provides a brief, valid and reliable model of the construct of workplace bullying. To the best of our knowledge this is the first nursing derived measure of WB that has demonstrated construct validity in the wider workforce. There is a strong tradition in the nursing literature of oppressed group explanations of nurse-bullying (Roberts *et al.*, 2009), this model has sustained perceptions of nurse bullying as a distinctive phenomenon of nursing (Freshwater, 2000). This study confirms that the nature of nurse bullying is very similar to that which occurs in the general workforce. While the model was representative of the construct among a sample of Australian public sector workforce, future research should apply this model to probability sample of the general Australian workforce to assess its wider generalizability.

Research into workplace bullying in the Australian context is as yet in it its infancy. This paper represents the first Australian-derived and empirically validated measure for workplace bullying. The brief measure of 13 items derived from our analysis could play an important role in identifying and describing the experience of bullying and informing intervention and control strategies. Further research, including longitudinal designs, is required to establish causal relationships between workplace culture and WB and exposure to WB and health and workplace outcomes, and to capture long-term effects of bullying on outcomes such as work performance.

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