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Abstract

Warr, Cook, and Wall's (1979) Job Satisfaction Scale is widely used measure of job satisfaction in industrial/organisational psychology research and practice. However, the factor structure has not been adequately explored, with two-factor and three-factor solutions previously proposed. This study tested the factor structure of the Job Satisfaction Scale using robust analysis methods on data gathered from a convenience sample of 381 (females = 264, males = 116) Australian employees. Confirmatory factor analyses supported a higher order three-factor model of job satisfaction over three factor, two factor and single factor models. Item 13, relating to satisfaction with hours of work, is weakly associated with other items and model fit improves if this item is deleted. The results support the continued use of an overall score of job satisfaction when using this measure in industrial/organisational psychology research and practice. Further testing of the structure is recommended within a range of employment sectors to see if the higher order three factor model holds.

Keywords: measurement, psychometrics, job satisfaction, Job Satisfaction Scale, validation, factor structure.

Confirmatory factor analysis of Warr, Cook, and Wall's (1979) Job Satisfaction Scale

Job Satisfaction (JS) is one of the most commonly measured constructs in industrial / organisational (I/O) psychology due to its links to individual and organisational workplace outcomes and conditions in the workplace (Dormann & Zapf, 2001). JS has been previously conceptualised as the "…passive acceptance of a (relatively) satisfactory situation" (Warr & Inceoglu, 2012, p. 133) by an employee, and this 'satisfactory situation' can be based on intrinsic (e.g., affective bond) and extrinsic (e.g., rate of pay) factors (Warr, Cook, & Wall, 1979).

Due to the broad applicability of the construct to a variety of organisational circumstances and paths of research inquiry, JS has been extensively linked to a multitude of constructs within the I/O psychology literature. Outcomes and antecedents such as employee affectivity (Dormann & Zapf, 2001), organisational commitment (Meyer & Allen, 1991; Meyer, Allen, & Smith, 1993), organisational culture (Balthazard, Cooke, & Potter, 2006; Bellou, 2010; Berson, Oreg, & Dvir, 2008; Cooper-Thomas, Van Vianen, & Anderson, 2004; Gregory, Harris, Armenakis, & Shook, 2009; Jandeska & Kraimer, 2005; Tzeng, Ketefian, & Redman, 2002; Yiing & Ahmad, 2009), workaholism (McMillan, Brady, O'Driscoll, & Marsh, 2002), stress and coping behaviour (Mohd Dahlan, Mearns, & Flin, 2010), and turnover intention (Seston, Hassell, Ferguson, & Hann, 2009) have been tied to the construct of JS. A meta-analysis on the correlates of JS by Faragher, Cass, and Cooper (2005) noted that depression, anxiety, burnout, and self-esteem were all moderately associated with JS. JS is clearly enmeshed within the broader understanding of I/O psychology, therefore, the integrity of its measurement and conceptualisation is an issue of importance for both academic and applied purposes.

Warr and Colleague's Job Satisfaction Scale (1979)

The Job Satisfaction Scale (JSS) presented by Warr, Cook, and Wall (1979) addressed the construct as the employee's satisfaction with the intrinsic and extrinsic facets of a specific job. The scale comprises 15 quantitative items indicative of underlying intrinsic/extrinsic factors related to JS, and a 16th item assessing the overall satisfaction the participant has for their job. To date Warr et al.'s publication has had in excess of 650 citations according to ISI Web of Knowledge records, and their JS measurement tool continues to be commonly used within academic and applied contexts.

In terms of the factor structure underlying the measure, Warr et al.'s (1979) preliminary cluster analysis of the relationships between indicators noted two acceptable solutions; a two-factor solution and a three-factor solution. The two factor solution, splitting the scale into the aforementioned intrinsic and extrinsic components, appears to be the most commonly used variant in the current literature (e.g., Cooper, Rout, & Faragher, 1989; Falkum & Vaglum, 2005; Goetz et al., 2012; Sevastos, Smith, & Cordery, 1992). The two subscales also demonstrated sufficient reliability; intrinsic JS a = .79 to .85, and extrinsic JS a = .74 to .78; in Warr et al.'s original article. The alternative three factor solution from the cluster analyses provided factors based on intrinsic JS from work, extrinsic JS from working conditions, and JS derived from employee relations. This third factor was regarded by Warr et al. as being neither intrinsically nor extrinsically anchored. Although a less acceptable alpha reliability for the employee relations factor (a = .58 to .60) was noted by Warr and colleagues, the employee relations and workplace conditions factors had similarly acceptable internal consistency to the two-factor solution.

In summary, the two factor JSS by Warr et al. (1979) appears to have sufficient internal consistency of scales, supporting its wide use in the literature since its initial publication. However the two possible factor solutions, combined with the current availability of more sophisticated methods of analysing factor structure, suggest the need for

further scrutiny of this commonly applied measure within the I/O psychology literature. This forms the focus of this article.

Structural Properties of the JSS

When considering the JSS's popularity in the organisational/industrial psychology literature, it is notable that to date confirmatory factor analysis has not been used to validate the factor structure of the measure. The original two and three factor structures provided by Warr and colleagues (1979) were based on cluster analysis: an exploratory technique. These exploratory findings are still cited in contemporary literature (e.g., Falkum & Vaglum, 2005; Mohd Dahlan et al., 2010; Ose et al., 2010; Solberg et al., 2012; Travers & Cooper, 1993; Turner, Ross, & Ibbetson, 2011), most frequently with reference to the two factor (intrinsic/extrinsic) solution. In terms of supplementary evidence of the scale's two-factor consistency however, past findings have been limited. Magnavita, Fileni, and Bergamaschi (2009) demonstrated a two factor solution via principle components analysis with an Italian translation of the scale, although the solution did not exactly mirror the items loadings in Warr et al.'s original intrinsic/extrinsic factor solution. Short forms of the scale, such as the eight-item variant by Dorman and colleagues (Dormann, Fay, Zapf, & Frese, 2006; Dormann & Zapf, 2001) based on Warr et al.'s original measure, also appear to *assume* two-factor representativeness on the basis of the original exploratory findings, yet do not provide evidence supporting this assumption. In summary, evidence for the two factor solution is primarily exploratory in quality, and of limited consistency.

Further data regarding the alternative three factor structure of the measure as presented by Warr et al. (1979) has been incidentally noted within the context of other studies. Ulleberg and Rundmo (1997) found a three factor solution to the JSS via principle components analysis when investigating stress factors for offshore oil personnel. While the authors describe the three-factor solution as being identical to the work of Warr et al. (1979),

the item-factor loadings differ between studies (e.g., three items versus five items for the extrinsic satisfaction factor). Additionally, Ulleberg and Rundmo presented an unacceptably low internal consistency for their Working Conditions Extrinsic JS factor (a = .57), concordant with previous findings by Warr et al. Due to variability in item-factor loadings and poor consistency with one of the extracted factors, the three factor solution appears to be weaker than the two-factor solution on the basis of these empirical findings.

In addition to the two and three-factor findings of previous research, the measures' factor properties have been further muddied by unidimensional solutions reported within the literature. Using exploratory factor analysis, Morrison (2004) found a single-factor solution best represented the underlying factor structure of the JSS. Furthermore, there are literature trends for profession-based divergences in the deployment of Warr et al.'s (1979) JSS. Cooper, Rout, and Faragher's (1989) choice to include 10 of the 16 JSS items when examining medical practitioners has been repeated by later investigations of the same field (e.g., Boran, Shawaheen, Khader, Amarin, & Hill Rice, 2012; Falkum & Vaglum, 2005; Goetz et al., 2012). Cooper et al. did not test the factor structure of the 10 item variant formally, however Hills, Joyce, and Humphries (2012) noted a single-factor solution via exploratory techniques to be best fitting to the data. Of note, all of the studies covered in the literature review thus far used exploratory rather than confirmatory factor analyses. It is apparent that there is limited consensus in the research literature on the factor structure of the JSS.

Measurement Validity and Applied Implications

The factorial validity of the JSS in I/O psychology is of two-fold importance, given the measure's theoretical and applied use. Firstly, in the context of theoretical development within the discipline, it is worrisome that a measure believed to be providing data on intrinsic/extrinsic JS may not necessarily be meeting this intended goal. For example,

Sevastos and colleagues' (1992) validation study on Warr's well-being measures used the intrinsic/extrinsic JSS subscales to demonstrate construct validity. Given the inconsistent evidence of the JSS's factorability and item-factor loadings, in effect it is unclear whether this evidence of construct validity has been undermined. Similarly McMillan and colleagues (2002) reported the use of six of Warr et al.'s (1979) intrinsic JS items to demonstrate external validity of a workaholism battery. The lack of clarity over the JSS factor structure weakens the JSS' utility as a means of external validation for other measures. Further, the lack of clarity regarding the factor structure of the JSS is potentially problematic in an applied context. Practitioners evaluating the JS of employees via the JSS may be erroneously assuming that the data can be considered in terms of its extrinsic and intrinsic subscales, when there is conflicting evidence to support that these factors are being measured with the intended items. The prospect of organisational wellbeing being partially measured on the basis of the JSS subscales is similarly worrisome, given the lack of confirmatory validation of the underlying factors. The theoretical and applied consequences of using a measure with an unclear factor structure highlight the need for a re-examination of the factor structure of the JSS.

Confirmatory factor analysis (CFA), unlike the exploratory methods used by Warr et al. (1979) and the aforementioned authors, provides an inferential method of determining whether the underlying factors of scale items are associated in the manner proposed by the researcher (Byrne, 2006). In this sense the arrangement of latent factors and associated scale items is not limited to *describing* as is the case in exploratory methods. Instead, CFA is an estimation of suitability regarding the patterns of data applied to the pre-defined constraints of a hypothesised structural model. The value of this method of structural confirmation in the social sciences is evidenced by its common usage (Byrne, 2006). Other validity assessments,

such as being able to account for the proportion of measurement error nested within the analysed data, are also performed as part of a standard CFA.

The inconsistent factor structure results reported in the literature highlight the need for confirmatory factor analysis of the JSS for research purposes. Further, determining the factor structure of the JSS is important for practitioners in terms of the validity of interpreting the outcomes where the measure is used for diagnostic purposes in the workplace. In terms of examining model fit, the theoretical and empirical literature to date suggest several model formulations warrant examination for model fit adequacy. First, the two-factor model of the JSS is expected to demonstrate the best model fit characteristics when examined using CFA, due to its theoretical consistency with Warr et al.'s (1979) intention with their measure of job satisfaction. Warr and colleagues (p. 133) described job satisfaction as "…the degree to which a person reports satisfaction with intrinsic and extrinsic features of the job", therefore this emphasis on the duality represented in the construct's conceptualisation should be of importance. Historically, the two-factor conceptualisation appears to be the most commonly used in the literature. Given the high correlations between subscales in Warr et al.'s originally reported data (r = .58 to .93), a two factor correlated model will be tested. Therefore the first hypothesis is as follows:

H1: The two-factor correlated model of the JSS will demonstrate adequate model fit statistics.

Second, the three-factor model will be examined for model adequacy. While Ulleberg and Rundmo (1997) extracted a three-factor solution that was thematically similar to Warr et al.'s (1979) original three-factor solution, the item-factor loadings were inconsistent across studies. The infrequent reporting of a three factor solution in the research literature, combined with variable item-factor loadings, suggests that this model may not be as stable as the two

factor solution. In reference to this pattern in the literature, the following two hypotheses are proposed as part of the goal of examining the JSS:

H2a: The three-factor correlated model of the JSS will demonstrate adequate model fit statistics.

H2b: The three-factor correlated model will not provide meaningfully better model fit than the two-factor correlated model.

Lastly, a unidimensional model will be tested for fit adequacy. Given prior unidimensional results from exploratory testing of the measure (Hills et al., 2012), it is valuable to test this variant of the JSS' latent factor structure. It would be expected that the model fit of the unidimensional variant would be poorer than the two-factor model due to the differences in model identification and the measure's intrinsic and extrinsic intentions as expressed previously. In the interest of testing model parsimony, however, we will also examine whether the increase in model fit stemming from specifying two underlying latent factors significantly improves model fit over the more parsimonious unidimensional model.

H3a: The unidimensional model of the JSS will demonstrate adequate model fit statistics.

H3b: The unidimensional model will provide poorer model fit than the two-factor correlated model.

Examination of commonly reported fit indices (Byrne, 2006) will be used to compare model fit across the two models tested.

Method

Design

A cross-sectional design was used for data collection.

Participants

Three hundred and eighty one (females = 264, males = 116) employees working in Australia participated in the study as part of a larger research project examining person-organization fit between 2009 and 2010. The majority of participants (N = 276) were sourced from local government bodies, with snowballing via social networking websites (N = 69), and a private healthcare provider (N = 36), serving as the sources for the remaining participants.

Measure

An online questionnaire was used in the collection of participant data. This questionnaire measured variables important to the aforementioned larger research project, such as demographic characteristics (age, gender, etc.), employee preferences for values and organisational culture, and outcome measures such as job satisfaction and organisational commitment. Only measures relevant to the current study are included in the following outline.

Job Satisfaction Scale. The construct of Job Satisfaction was measured using the items developed by Warr et al. (1979). The overall measure of job satisfaction was composed of all 15 quantitative items in the measure. Item 16, an overall summary item, was not tied to any of Warr et al.'s originally proposed subscales and was not included in the forthcoming analyses. Participants responded to each statement regarding their work on a Likert-style scale, with a response range from 1 ("I'm extremely dissatisfied") to 7 ("I'm extremely satisfied") as outlined by Warr et al. The item-factor loadings for the two and three factor solutions in Warr and colleague's original article are presented in Table 1.

(Table 1 about here)

Procedure

Following Human Research Ethics Committee approval, participating organizations emailed their employees about the availability of the questionnaire. Volunteering participants were provided with a link to an external website containing participant information regarding

the purpose of the study, and the online questionnaire. At the conclusion of the questionnaire participants were offered the option of participating in a prize draw (one of three gift cards). Participants approached via snowballing from social networking websites followed a similar procedure to that outlined prior, and were provided with the link to the participant information / online questionnaire and offered inclusion in the prize draw.

Results

Preliminary assessments of descriptive statistics were conducted using the software SPSS 20.0 for Windows, and confirmatory factor analysis (CFA) was conducted using the statistical software EQS 6.2 for Windows. Statistical significance was assessed against α of .05 unless otherwise indicated. Missing data analyses indicated that none of the 15 job satisfaction indicators had missing data in excess of 5%, and Little's MCAR test was non-significant, χ^2 (413) = 450.06, p = .101, therefore indicating data was missing completely at random. Missing values were replaced using Expectation Maximisation procedures. Age, organisational tenure, and occupational tenure descriptive statistics are presented in Table 2. No significant differences in overall JS between genders, and no significant bivariate correlations between overall JS and the age/tenure variables, were present.

(Table 2 approximately here)

Intercorrelations and descriptive statistics of the items are presented in Table 3. Concordant with Warr et al.'s (1979) predictions, mean scores for each item were generally elevated above the mid-point of the scale range. Standard deviations indicated similar levels of variance for each item. Indicator-level normality was not supported by Shapiro-Wilk indices (p < .05 for all indicators), revealing a negative skew for all indicators. Furthermore multivariate kurtosis was a potential problem during model estimation due to a larger than ideal normalised estimate, $K_{\text{Multivariate}}$ = 31.96 > 5.0 (Byrne, 2006). Prospective issues with normality violations during CFA were addressed by employing robust maximum likelihood

model estimation methods, and the Satorra-Bentler (1988) chi-square (*S-B* χ^2) statistic (Byrne, 2006; Kline, 2005) when examining model fit criteria. *S-B* χ^2 statistics, Comparative Fit Indices (CFI), Root-Mean Square Error of Approximation (RMSEA) coefficients and confidence intervals, and Aikake's Information Criterion (AIC) were examined to provide further information regarding model fit as per the recommendations of Byrne (2006).

(Table 3 approximately here)

The first model tested was the single factor solution (Global Job Satisfaction) of Warr et al.'s (1979) JSS measure, which loaded all item-level indicators on one latent factor. The correlated Intrinsic and Extrinsic JS model was then measured for fit adequacy. The correlated Job Itself Intrinsic Satisfaction, Working Conditions Extrinsic Satisfaction, and Employee Relations Satisfaction model was examined last during the CFAs conducted. The model adequacy and fit indices for the three models tested are summarised in Table 4.

The *S-B* χ^2 statistics were significant ($p < .001$ in all cases), and therefore indicative of less than optimal model fit for all measured models (see Table 4 for model fit indices). To provide supplemental information on model fit, comparative fit indices (CFI), and RMSEA coefficients and confidence intervals were also examined. The three-factor model indicated acceptable model fit on the basis of these alternative model adequacy criteria. The RMSEA values for the three-factor model were also considered indicative of adequate model fit, *RMSEA* < .080, as were the upper/lower confidence intervals. Most striking was the reduction in AIC values between models; while the global and two-factor models indicated a smaller reduction in AIC values in the expected direction, the decrement for the three-factor model was notable (see Table 4). The reduction in AIC values for the three-factor model suggested that it was the best-fitting model most likely to replicate of the three examined. The correlations between the latent factors for the two-factor ($r = .96$) and three-factor ($r = .86$; $r = .94$; $r = .78$) models indicates the factors are strongly associated.

Hypothesis 1, predicting adequate model fit for the two-factor correlated model, was not supported by the model fit coefficients. Hypothesis 2a was partially supported by the data, as despite the significant *S-B* χ^2 values, the remaining model fit criteria were acceptable, and the three-factor model compared favourably to the two- and uni-factor models. Hypothesis 2b was not supported; to the contrary, the three-factor model demonstrated better model fit in comparison to the two-factor model. Hypotheses 3a, concerning the fit adequacy of the unidimensional model, was not supported. Hypothesis 3b was not supported by the results, due to the limited changes in predictive model fit values derived from AIC coefficient comparisons.

Follow-up Analyses. While the intent of the current paper was to conduct a confirmatory examination of the JSS based on the model configurations presented by Warr et al. (1979), both the correlated two factor and the best-fitting three-factor solution had notable problems in terms of the high correlations between latent factors. This finding indicates a possible hierarchical relationship between the latent factors within the JSS and a higher-order global job satisfaction latent factor. As the unidimensional model had previously presented unsatisfactory model adequacy results (see Table 4), hierarchical interpretations were deemed to be theoretically-consistent follow-up analyses to the CFAs conducted (Byrne, 2006).

Examination of the two- and three-factor models outlined by Warr et al. (1979) was adjusted to test for a second-order global JS factor predicting endogenous latent factors. The global JS factor's variance was fixed to 1.0 to enable estimation of the regression paths to each dependent factor (Byrne, 2006). Additionally, disturbances of the first pair of dependent latent factors were constrained to add an additional degree of freedom in the higher-order model (Byrne). Model estimation results are presented in Table 4. The three-factor hierarchical model demonstrated improved predictive fit via the notably lower AIC value in comparison to the two-factor hierarchical model, $AIC_{\text{Two-factor}} = 149.74 > AIC_{\text{Three-factor}} =$

79.34. Strong coefficients for the regression paths to each endogenous factor (r = .91; .89; .92) consolidated evidence for strong ties to a global JS factor within the three-factor hierarchical model.

While the hierarchical three-factor model demonstrated sufficient model adequacy, the thirteenth item in the JSS "Your hours of work" (Warr et al., p. 146) presented a notably low path coefficient of r = .38 stemming from the Working Conditions Extrinsic Satisfaction factor. As this item has loaded weakly on all models tested and is only weakly correlated with other items in the measure, we examined whether improvements in model adequacy and parsimony could be achieved by removing this item from the final model. Fit statistics indicate the final three-factor hierarchical model without item 13 is the best available model to explain the factor structure of the JSS, indicating the suitability of the 14 items as an overall measure of job satisfaction. This overall measure has good internal reliability (α = .91, ρ = .92). Figure 1 presents the model fit statistics for the hierarchical three-factor model that did not include item 13 in its configuration.

(Table 4 approximately here)

(Figure 1 approximately here)

Discussion

We set out to examine the factor structure of the JSS. Based on Warr and colleagues' (1979) theoretical depiction of intrinsic and extrinsic factors underlying the JSS, in combination with their exploration of the underlying factor structure of the JSS, it was expected that a two factor model would provide superior fit to other possible models. This was not supported by the current study. Instead, a higher order three factor model was preferred based on superior fit statistics.

Our study found the same pattern of item loadings onto the three factors previously reported by Warr et al. (1979), although it is notable that the other study which also reported

a three factor solution (Ulleberg & Rundmo, 1997) showed slightly different item loadings. In the current study, Item 13, relating to satisfaction with hours of work, is the weakest of the JSS items and model fit is improved when this item is removed.

It remains surprising that other than Ulleberg and Rundmo's (1997) study, no other studies have supported the three-factor model since Warr et al.'s (1979) original analysis. As noted in the literature review however, examination of the factorability of the JSS (when conducted at all) was incidental to the goals of the researchers using the measure. Given the greater emphasis on the *assumed* two-factor structure underlying the JSS in most of the literature involving the measure, even in contemporary use of the measure (e.g., Goetz et al., 2012), this finding is concerning. However, our results indicate that the factors (whether conceptualised as two or three) are highly correlated and may be best represented by a higher order model, suggesting that in pragmatic terms the use of the measure as one, two or three scores in previous research and practice is unlikely to have resulted in widely varying findings. In summary, the higher order three-factor model provided the best model fit to the data in the current study, but would benefit from further confirmatory validation in future studies. It is recommended that the total score of the items is used in future studies and practice. The factors are too highly correlated to justify their use as independent scores. Researchers may choose to retain Item 13 where it is planned to compare results with previous studies, or drop the item where this is not a requirement.

Study Limitations

The homogeneity of individuals participating in the study may limit the external validity of these findings. Approximately three quarters of the participants were public servants, however employee industry of origin diversity was improved by the inclusion of employees from a private healthcare provider and participants recruited through online-snowballing. Of note, Ulleberg and Rundmo's (1997) three-factor solution to the JSS was

gathered from a largely blue-collar sample (employees working on a remote oil platform). Therefore the three-factor model's improved model fit in the current study is difficult to ascribe to sector-biased sample artefacts. Future confirmatory factor analyses are warranted within the private sector industries. This information would further benefit evidence-based practitioner approaches to job satisfaction measurement within these industries.

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Table 1

Cluster Analysis Item-factor Loadings Derived from Warr et al. (1979)

	Two Factor Solution		Three Factor Solution		
Item	Intrinsic	Extrinsic	Job Itself Intrinsic	Working Conditions Extrinsic	Employee Relations
1. Physical work conditions		■		■	
2. Method of working	■		■		
3. Fellow workers		■		■	
4. Recognition	■				■
5. Immediate boss		■		■	
6. Responsibility	■		■		
7. Pay		■			■
8. Abilities	■		■		
9. Industrial relations		■			■
10. Promotion	■				■
11. Management		■			■
12. Suggestions	■				■
13. Hours		■		■	
14. Variety	■		■		
15. Job security		■		■	

Note. For full items see Warr et al. (1979, pp. 145-146).

Table 2

Participant Demographic Descriptive Summary Statistics (N = 381)

	Mean	*Standard Deviation*
Age (years)	38.18	13.27
Occupational Tenure (years)	10.51	10.73
Organizational Tenure (years)	4.66	6.05

Table 3

Summary of Intercorrelations, Means, and Standard Deviations for the JSS (Warr et al., 1979) Items (N = 381)

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1. Physical work conditions	1														
2. Method of working	.460	1													
3. Fellow workers	.279	.336	1												
4. Recognition	.388	.484	.440	1											
5. Immediate boss	.398	.539	.379	.602	1										
6. Responsibility	.390	.504	.278	.475	.508	1									
7. Pay	.280	.299	.196	.382	.209	.394	1								
8. Abilities	.367	.521	.298	.512	.477	.684	.447	1							
9. Industrial relations	.363	.459	.374	.610	.466	.463	.415	.449	1						
10. Promotion	.315	.327	.291	.506	.384	.482	.449	.548	.511	1					
11. Management	.494	.488	.401	.606	.542	.474	.371	.497	.700	.556	1				
12. Suggestions	.388	.541	.419	.645	.545	.533	.336	.539	.656	.531	.650	1			
13. Hours	.243	.304	.158	.255	.137	.200	.279	.246	.258	.288	.260	.337	1		
14. Variety	.245	.405	.170	.360	.326	.515	.253	.625	.276	.411	.329	.338	.233	1	
15. Job security	.289	.333	.275	.341	.267	.330	.223	.378	.246	.299	.360	.370	.366	.333	1
M	5.39	5.51	5.50	4.90	5.26	5.52	4.71	5.24	4.61	4.33	4.63	4.94	5.47	5.44	5.51
SD	1.16	1.12	1.24	1.53	1.50	1.21	1.46	1.35	1.53	1.47	1.49	1.37	1.13	1.23	1.32

Table 4

CFA Model Adequacy Statistics Based on Warr et al.'s (1979) JSS Models (N = 381).

Factor	*S-B* χ^2 (*df*)	CFI	RMSEA (90% CI lower, upper)	Model AIC
Hypothesised Models				
Global JS	333.65 (90)***	.858	.084 (.075, .094)	153.65
Two-Factor Correlated Model	327.75 (89)***	.861	.084 (.074, .094)	149.75
Three-Factor Correlated Model	240.85 (87)***	.910	.068 (.058, .078)	66.85
Hierarchical Models				
Two-Factor Model	327.74 (89)***	.861	.084 (.074, .094)	149.74
Three-Factor Model	255.32 (88)***	.903	.071 (.061, .081)	79.34
Three-Factor Model (sans item 13)	206.47 (74)***	.919	.069 (.058, .080)	58.47

Note., CFI = Comparative Fit Index; RMSEA = Root Mean Square Error of Approximation; AIC = Akaike's Information Criterion.

*** $p < .001$.

Figure Caption *Figure 1*. Model loadings for the hierarchical three-factor model.