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Title:
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Date:
2014-08-01

Citation:
Slemp, G. R. & Vella-Brodrick, D. A. (2014). Optimising Employee Mental Health: The Relationship Between Intrinsic Need Satisfaction, Job Crafting, and Employee Well-Being. Journal of Happiness Studies, 15 (4), pp.957-977. https://doi.org/10.1007/s10902-013-9458-3.

Persistent Link:
https://hdl.handle.net/11343/282831

Optimising employee mental health: The relationship between intrinsic need satisfaction, job crafting, and employee well-being.

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Abstract

Organisations are frequently confronted with the issue of how to enhance employee mental health. Based on Self-Determination Theory, a model is proposed that examines the relationships between job crafting, the satisfaction of the intrinsic needs for autonomy, competence, and relatedness at work, and employee well-being – defined here as both subjective well-being and psychological well-being. A sample of 253 working adults completed a battery of questionnaires including the job

crafting questionnaire, the Intrinsic Need Satisfaction Scale, and the Mental Health Continuum. Using Structural Equation Modelling (SEM) methods, it was determined that job crafting predicted intrinsic need satisfaction, which, in turn, predicted employee well-being. The results suggest that job crafting may be an important underpinning upon which to base an employee well-being intervention.

Keywords: Job Crafting, Well-Being, Self-Determination Theory, Autonomy, Competence, Relatedness, Need Satisfaction

Paid employment is a fundamental part of adult life. It comprises about a third of one's conscious experience, and is an important source from which to develop a sense of identity, establish relationships, and firm one's self-esteem (Markiewicz, Devine, & Kausilas, 2000; Pierce & Gardiner, 2004; Pratt, Rockmann, & Kaufmann, 2006). Given this significance, there exists a need to examine ways in which employees can enhance their work experience so as to attain a greater sense of purpose, meaning, and ultimately, well-being. One promising, yet relatively

unexplored concept in the literature is job crafting (Wrzesniewski & Dutton, 2001).

Job Crafting Conceptualisation

Job crafting is described as the ways in which employees take an active role in initiating physical or cognitive changes to the way in which they approach their work. Rather than making changes to the structural characteristics of their jobs, job crafting is an informal process that focuses on the positive changes that employees can make within their job boundaries. They initiate these informal changes in order to shape their work practice to align with their idiosyncratic interests and values, and ultimately, enhance the enjoyment, meaning, and satisfaction they attain from their work. In this way, job crafting is a form of proactive behaviour, driven by employees rather than management (Grant & Ashford, 2008). This is an important distinction between job crafting and related constructs such as job enlargement and job enrichment, which are focused on work design and hence making alterations to the structural characteristics of jobs. Job enlargement involves expanding jobs 'horizontally' and therefore increasing the breadth of activities one performs at work, whereas job enrichment involves expanding jobs 'vertically' to increase one's responsibility to make decisions. Job crafting, in contrast, is at the discretion of the individual—working within

their job boundaries—to mold their work experience so that it aligns with their individual needs and desires.

Wrzesniewski and Dutton (2001) identify three ways in which employees can craft their jobs. *Task crafting* refers to initiating changes to the number or type of activities one completes on the job (e.g., introducing new tasks that better suit one's skills or interests). *Relational crafting* involves exercising discretion about who one interacts with at work (e.g., being proactive about making friends with people who possess similar skills or interests). *Cognitive crafting* is distinct from task and relational crafting in that it involves altering how one 'sees' their job, with the view to making it more personally meaningful (e.g., making an effort to recognise the effect of one's work on the success of the organisation or community). All three types of job crafting represent unique ways in which employees initiate changes within their job boundaries in order to enhance their work enjoyment and purpose.

Most of the research on job crafting to date has been qualitative or theoretical in nature (e.g., Berg, Grant, & Johnson, 2010; Berg, Wrzesniewski, & Dutton, 2010; Fried, Grant, Levi, Hadani, & Slowik, 2007; Lyons, 2008; Wrzesniewski & Dutton, 2001). This is probably because, until very recently (e.g., Tims, Bakker, & Derks, 2012), there has been no generic and universal questionnaire with which the construct

can be reliably and validly measured. Previous efforts to develop a measure have focused on specific populations of interest, such as manufacturers (e.g., Ghitulescu, 2006) teachers (Leana, Applebaum, & Shevchuk, 2009), and blue-collar workers (Nielsen & Abildgaard, 2012), and are thus not appropriate for the general adult working population. Hence, despite job crafting representing a promising process employees can use to enhance their work experiences, beyond the work of Tims et al. (2012) and Petrou, Demerouti, Peeters, Schaufeli, and Hetland (2012), at present there has been a dearth of research on the relationships between job crafting and important employee outcomes, particularly well-being.

Well-Being and Work Behaviour

Well-being is defined here as the presence of optimal psychological functioning, and the literature identifies two distinct approaches to well-being research (Deci & Ryan, 2008; Ryan & Deci, 2001). First, there is the hedonic approach, which is captured by the concept of subjective well-being (SWB; Diener, Suh, Lucas, & Smith 1999; Diener, 2000). SWB is the scientific term attributed to happiness or 'the good life', and can be broken down into two further components. The cognitive component refers to an individual's satisfaction with their life as a whole, whereas the affective component refers to the presence of high positive affect (PA) and the relative absence of negative affect (NA). The second

approach to well-being is the eudaimonic approach, which can be defined broadly as embracing the existential challenges of life (Linley, Maltby, Wood, Osborne, Hurling, 2009; Keyes, Shmotkin, & Ryff, 2002), or the actualisation of human potential (Ryan & Deci, 2001). It recognises that not all human pursuits result in optimal well-being, despite the fact that they are pleasurable. The eudaimonic approach is best captured with the concept of psychological well-being (PWB), and hence represented with Ryff's (1989) six factors of positive functioning: self-acceptance, purpose in life, autonomy, personal growth, environmental mastery, and positive relationships with others. These factors provide increased precision and guidance about what it means to achieve eudaimonic living.

Although many studies have ignored the eudaimonic approach to well-being due to a lack of theoretical consistency in its definition (Kashdan, Biswas-Diener, & King, 2008; Linley et al., 2009; Waterman, 2008), it is important for research to incorporate both approaches into well-being research. Consistent with this view, Linley et al. (2009) found both SWB and PWB to load on two distinct, yet related components of a higher order well-being construct. Hence, this operationalisation captures a more comprehensive well-being model that helps clarify what it truly means to be psychologically healthy. It also allows researchers to determine whether various workplace activities explain variance in mental health beyond the hedonic, pleasurable component. Moreover, it

allows researchers to determine whether different interventions affect different well-being outcomes.

Workplace Well-being (WWB), consisting of work-related affect and job satisfaction, has been offered as a third component to an even more comprehensive well-being model (Page & Vella-Brodrick, 2009). However, to maintain consistency with the dual approach to well-being (Ryan & Deci, 2009), which has empirical support (Linley et al., 2009), well-being was operationalised here as consisting of both SWB and PWB.

Job crafting is one such process through which employees can enhance the meaning they attain from their work, and in so doing, optimise their well-being. An underlying premise of job crafting is that employees use it to align their work with their individual needs and values. Job crafting, then, likely results in work that is more fulfilling, offers greater opportunity to establish relationships, and also enhances the individual purpose, meaning, and value that employees attain from the daily activities they encounter on the job. It likely shifts the motivation to work beyond the material or financial benefits that work offers, toward a state where the motivation to work is attained from the intrinsic enjoyment and satisfaction from the work itself. Hence, job crafting is a process through which employees can turn their ordinary jobs into an

occupational *calling* – defined broadly as an occupation that an individual is drawn to, finds intrinsically enjoyable and meaningful, and perceives as a central part to their identity (Wrzesniewski, McCauley, Rozin, & Schwarz, 1997). Indeed scholars have suggested that job crafting is a process employees use to facilitate the kinds of pleasurable psychological states that are associated with pursuing occupational callings (Berg, Grant, & Johnson, 2010).

The concept of an occupational calling aligns closely with the fundamental principles of both employee PWB and SWB. Those who work in an occupational calling tend to see their work as the most important part of their life. They tend to take their work with them on holidays, derive a great sense of pleasure from their daily activities, and intrinsically love their job (Wrzesniewski et al., 1997). All such experiences are likely to make employees feel good about their work because they think it will make the world a better place, resulting in enhanced meaning, purpose, and fulfillment – all of which are associated with eudaimonic living, and hence, PWB. Those working in an occupational calling are also likely to experience an enhanced level of pleasure and enjoyment from their work, and thus SWB. Supporting these relationships, Wrzesniewski et al. (1997) showed that calling employees reported higher job satisfaction and miss fewer days of work

on average than employees who viewed their occupation as simply a means to earn money (i.e., a 'job'), or as a way to earn promotions into roles of greater status and seniority (i.e., a 'career').

Despite the promising potential of job crafting for employee well-being, a scarcity of research has empirically explored this relationship, and it thus remains an untested theoretical hypothesis. Some authors (e.g., Nielsen & Abildgaard, 2012; Petrou et al., 2012; Tims et al., 2012) have made a keen start, yet this research is limited to specific indicators of well-being (e.g., engagement, job satisfaction, burnout), rather than broader employee well-being outcomes, including both hedonic and eudaimonic components. Should a positive association between job crafting and employee well-being become established, researchers will have preliminary grounds upon which they can design job crafting interventions and enhance their efficacy in enhancing employee wellness. The relationships between other forms of proactive behaviours and organisational or individual performance (e.g., Grant, Parker, & Collins, 2009; Seibert, Kraimer, & Crant, 2001; Thompson, 2005; Van Scotter, Motowildo, & Cross, 2000) also provide evidence for the promising potential of job crafting activities to be associated with desirable workplace outcomes beyond well-being.

Importantly, however, not only is an explanation of the 'why' of job crafting important, but an exploration of the 'how' is equally important to extending theory and research. Understanding how job crafting works to enhance employee well-being will allow researchers to further explain the mechanisms that operate to boost well-being, and hence provide direction for more targeted and creative interventions. Due to the lack of empirical research on job crafting activities at work until recently, there is at present no underlying motivational theory that explains how it is able to affect work outcomes. One possible answer to this gap lies in exploring the relationship between job crafting and inherent psychological needs.

Job Crafting, Self Determination, and Well-Being

Self-Determination Theory (SDT; Deci & Ryan, 1985, 2000; Ryan & Deci, 2000) suggests the existence of universal psychological needs, that when satisfied, lead to optimal functioning and psychological adjustment. Namely, these are the needs for autonomy, competence, and relatedness. *Autonomy* requires the experience of choice and being the initiator of one's own behaviour. *Competence* requires succeeding at challenging tasks and ultimately attaining desired outcomes. *Relatedness* requires a sense of caring, mutual respect, and mutual reliance with others. The extent to which the three needs are satisfied in the workplace determines the level of well-being that employees experience. Ryan and Deci (2000)

specify these necessary psychological nutriments for ongoing psychological growth, health, and well-being, and their satisfaction is suggested to be associated with optimal functioning, eudaimonia, and integrity. Indeed several studies have supported this implicit theoretical assumption: need satisfaction is an important antecedent to well-being . This includes cross-sectional (e.g., Deci et al., 2001; Ilardi, Leone, Kasser, & Ryan, 1993) and longitudinal studies (e.g., Sheldon & Elliot, 1999), which have shown need satisfaction to be a robust predictor of well-being. This is supported by studies of momentary need satisfaction (e.g., Howell, Chenot, Hill, & Howell, 2011) as well as daily diary studies of need satisfaction (e.g., Reis, Sheldon, Gable, Roscoe, & Ryan, 2000; Sheldon, Ryan, & Reis, 1996). Moreover, experimental evidence (e.g., Sheldon & Filak, 2008) has supported the causal direction of these relationships, and hence, it is hypothesised that need satisfaction will positively predict both SWB and PWB.

Other research has examined ways in which need satisfaction can be enhanced. Contextual variables such as autonomy support appear important for need satisfaction (Baard et al., 2004; Deci et al., 2001). Similarly, behavioural variables such as setting self-concordant goals (i.e., goals consistent with one's intrinsic values and interests; Sheldon & Elliot, 1999), and using one's character strengths (e.g., Linley, Nielson, Gillett, & Biswas-Diener, 2010) have been shown to facilitate need

satisfaction. However, beyond these lines of research there are few studies that have examined behavioural antecedents to the three needs. There are even fewer studies exploring these antecedents in work settings or in working samples. Hence, an empirical exploration of job crafting and its relationship to employee intrinsic needs may help unearth other methods by which well-being can be enhanced.

Of particular relevance to SDT, Wrzesniewski and Dutton (2001) argued that individuals who craft their job do so to maintain control over their work, to create a positive self-image for themselves in their work, and to connect with others in the workplace. This motivation to engage in job crafting aligns closely with the three SDT needs for autonomy, competence, and relatedness, respectively. For example, task crafting requires a sense of control over one's work and will also enhance the perception of personal control one has over their work. It is likely that such experiences will facilitate the satisfaction of the need for autonomy. Cognitive crafting allows employees to reframe their work cognitions so as to create a more constructive self-image of themselves at work. It will enhance the awareness and appreciation that employees have for the potential value of their work for the organisation, the community, and their lives. These experiences, in turn, will likely facilitate the need for competence. Relational crafting will influence the degree to which

employees connect with others at work and therefore their ability to create positive, sustainable relationships. Hence, relational crafting aligns with the need for relatedness. Based on the conceptual alignment between job crafting and need satisfaction detailed here, it is predicted that all three forms of job crafting will positively predict employee need satisfaction.

Aim and Hypothesised Model

In this study, job crafting among adult employees is examined. The purpose of this study is two-fold. First, we aim to explore the utility of job crafting for employees and thus explore the relationship between job crafting and employee well-being. Here the operationalisation of job crafting is guided by the three component model offered by Wrzesniewski and Dutton (2001), which consists of the task, relational, and cognitive crafting dimensions. Cognitive crafting—a concept typically not addressed in previous job crafting measures—is a necessary inclusion to the empirical literature as crafting cognitions about work is an important way in which individuals can shape their work experience (Wrzesniewski & Dutton, 2001). Indeed, it may help employees to

appreciate the broader effects of their work and to recognise the value that their job may hold in their life. Hence, a measure developed specifically for this study that assesses the extent to which employees engage in all three forms of job crafting was used. This means that the measure used in the present study has several items devoted to each of these three dimensions of job crafting.

Tims et al. (2012) recently conducted some research using a generic scale of job crafting and organisational outcomes. Although these authors did not examine the specific relationship between job crafting and well-being, their results showed a negative relationship with employee cynicism and a positive relationship with engagement. Similarly, Petrou et al. (2012) used a modified version of the same scale and found associations between some facets of job crafting and employee engagement. Nielsen and Abildgaard (2012) extended these findings longitudinally by detecting associations between job crafting and increased Time 2 levels of job satisfaction and engagement, as well as lower burnout, which provides preliminary support for a positive association between job crafting and employee well-being. Indeed, research examining broader and positive well-being outcomes is also needed. Hence, the present study will extend these findings by a) using a more comprehensive model of mental health that includes the operationalisation of both eudaimonic and hedonic well-being, and b)

using a measure of job crafting that aligns with Wrzesniewski and Dutton's (2001) three component model that includes a cognitive dimension of crafting. Second, at present there is no underlying motivational theory about how job crafting might lead to employee outcomes. Hence, the second aim of this study is to extend theory on job crafting by examining the underlying mechanisms by which it predicts employee outcomes. Implicit in the premise of SDT is that the satisfaction of the needs for autonomy, competence, and relatedness leads to an ongoing sense of growth, fulfillment, and well-being (Deci & Ryan, 2000). Hence, activities that aid the satisfaction of the three needs will likely result in an enhanced state of well-being, and, as argued, job crafting constitutes a form of activity that may lead to well-being through the satisfaction of these needs.

Insert Figure 1 about here

The hypothesised mediation model is presented in Figure 1. As can be seen in this diagram, it is hypothesised that task, relational, and cognitive forms of job crafting will predict work related need satisfaction, which, in turn, will predict both SWB and PWB. Hence, it is expected

that need satisfaction will mediate the relationship between job crafting and employee well-being. Moreover, it is hypothesised that need satisfaction will exhibit both a direct relationship with SWB and an indirect relationship through PWB. This latter prediction is made due to the concept of PWB being rooted in eudaimonia, a life well lived, and optimal psychological functioning. Whereas SWB has been considered an ideal state of happiness, PWB is one way in which humans express their virtues in order to attain that ideal, and hence, several authors have now made reference to the hedonic component of well-being (SWB) as a by-product or outcome of eudaimonic living (e.g., Ryan & Deci, 2001; Ryan, Huta, & Deci, 2008; Ryff, 1989; Ryff & Singer, 1998). Ryff and Singer (1998), for example, cite evidence that eudaimonic living, as represented by PWB, can lead to enhanced immunological functioning and health promotion, which itself is associated with the hedonic features of positive mood and stress relief. Similarly, Ryff and Keyes (1995) reported moderate to strong correlations between their assessment of PWB and happiness, life satisfaction, and depression. Hence, the increase in PWB is likely to accentuate the perception of a life well lived, and, in turn, subjective happiness.

Method

Participants

A total sample of 334 employees participated in the study. Of these, 253 (75.7%) provided complete data for all the measures required in the analysis. This group thus represented the sample used in the study. T-tests revealed that there were no mean differences with respect to any of the study variables between the complete and missing data sets (all *p's* > .05), suggesting that the missing data were missing at random (Little & Rubin, 2002). More than half the participants were female (66.8%) and the mean age was 41.94 (*SD* = 11.38). The majority worked full-time (76.4%), and on average participants worked 38.02 hours per week. There was no cutoff for the number of weekly hours employees worked in paid employment. Most employees worked in a large Australian university (68.0%), or were working within the human resources departments within one of Australia's large banking and financial services firms (6.4%), and a large Australian healthcare organisation that offers health insurance products and services (6.0%). The university staff were employed within a range of departments, including administration, library services, human resources, and some academic staff. T-tests revealed that there were no differences on the study variables between these sample groups (all *p's* > .05). The mean income was $76,371 (AUD) per annum (*SD* = $52,454), and the mean years of education was 17.60 (*SD* = 3.56).

Procedure

The majority of the sample was contacted through the company where they worked (86.6%), which included a large academic institution, a large Australian banking and finance company, and a large Australian health insurance company. In each case, an organisational representative sent out staff emails and/or newsletters inviting their staff to participate. Other participants were recruited through advertisements on online discussion forums and social networking sites. As an incentive, participants could choose to enter a draw to win an 8 GB iPod touch as a result of completing the questionnaires. The email and newsletters contained a link to the study explanatory statement, which then directed participants to the questionnaires. It was made known to participants that they could choose not to participate and that their managers would never attain access to their responses. The set of questionnaires was counterbalanced to ensure that the order of presentation of each questionnaire was not the same for the entire sample.

Measures

Job crafting. The Job Crafting Questionnaire (JCQ; Slemp & Vella-Brodrick, 2012) was developed and validated to be used in this study. By drawing on a review of the extant literature and previous attempts to develop a job crafting measure, a list of 15 items were devised to assess ways in which employees engage in task, relational, and cognitive

crafting: five items for each of task, relational, and cognitive crafting. One item for each of task and relational crafting were adapted from Leana, Applebaum, and Shevchuk (2009), while the remainder of the items were original. Items represented a unique form of job crafting behaviour or cognition, and respondents were instructed to indicate the extent to which they engaged in each type of behaviour or cognition on a 6-point Likert scale from 1 (hardly ever) to 6 (very often). Sample items are as follows: for task crafting, "choose to take on additional tasks at work"; for relational crafting, "make an effort to get to know people well at work"; and for cognitive crafting, "think about how your job gives your life purpose". The Cronbach's alpha for the total job crafting scale was .91, and the subscales obtained Cronbach's alpha values of .87, .83, and .89 for task, relational, and cognitive crafting, respectively. The 15 item scale is shown in Appendix A.

Slemp and Vella-Brodrick (2012) supported a three factor solution using exploratory factor analytic procedures, which was supported by confirmatory factor analysis, showing the job crafting items to load independently and strongly on their respective factors (χ^2/df = 1.71, CFI = .96, NNFI = .95, IFI = .96, RMSEA = .06)[1]. Moreover, the scale correlated positively with proactive employee behaviours (e.g., organisational citizenship behaviour [.47], the extent to which employees

[1] *Note*: χ^2/df = normed chi square, CFI = comparative fit index; NNFI = non normed fit index; IFI = incremental fit index; RMSEA = root mean square error of approximation.

use their strengths [.49], and self-concordant goal setting [.34]), as well as job satisfaction (.43). It also correlated negatively with work specific negative affect (-.26), supporting its validity.

Intrinsic need satisfaction at work. The Intrinsic Need Satisfaction Scale (Baard, Deci, & Ryan, 2004) was used to assess the extent to which employees' intrinsic needs for autonomy, competence, and relatedness were satisfied on the job. Consisting of 21 items, the questionnaire contained seven items for autonomy, six items for competence, and eight items for relatedness. Participants responded on a 7-point Likert scale, from 1 (strongly disagree) to 7 (strongly agree). Sample items are as follows: for autonomy, "I feel like I can make a lot of inputs to deciding how my job gets done"; for competence, "People at work tell me I am good at what I do", and for relatedness, "I get along with people at work".

Composite scores were calculated for each need by creating a mean score for each participant for each need. These composite scores were then used as three observed variables for the latent variable *intrinsic need satisfaction at work*. The Cronbach's alpha for the total need satisfaction scale was .90. The Cronbach's alphas for autonomy, competence, and relatedness were .79, .87, and .74, respectively. Baard et al. (2004) also showed the measure correlates positively with psychological adjustment and work performance ratings, supporting its convergent validity.

Well-being. Well-being was measured with Keyes' (2007) Mental Health Continuum, which assesses positive emotions (SWB), positive psychological functioning (PWB), and positive social functioning (social well-being). This measure was selected as it offered a concise, yet valid and reliable way to investigate SWB and PWB simultaneously. Although the measure consists of the three subscales, only positive emotions and psychological functioning were used for the current study as this was consistent with the dual approach to well-being (e.g., Ryan & Deci, 2001) described earlier. Three items were used to assess SWB, and four out of the six original items were used to assess PWB – two items were dropped to enhance the fit of the measurement model as recommended by the two-step approach to structural equation modelling (Anderson & Gerbing, 1988), which is to first ensure each observed variable is satisfactorily related to its respective latent variable, and only after this step is the full structural model is tested. Participants were instructed to indicate how often they had experienced each feeling in the past month on a 6-point scale, from 1 (never) to 6 (everyday). Sample items are as follows: for SWB, "Interested in life"; and for PWB, "That you have experiences that challenge you to grow and become a better person". The Cronbach's alpha for the total scale was .89. The Cronbach's alpha for the SWB and PWB components of the scale were .90 and .80, respectively. Keyes et al. (2008) used confirmatory factor analysis (CFA) to support a three-

factor structure of SWB, PWB and social well-being. Keyes et al. also showed the scale correlated moderately strongly with positive affect (.52), and moderately with general self-efficacy (.39), satisfaction with life (.37), coping strategies (.34), sense of coherence (.32), and community collective self-efficacy (.30). It also correlated negatively with the symptoms of psychopathology (-.22), hence supporting its validity.

Overview of the Model Testing Approach

Structural equation modelling (SEM) methods were used for the data analysis. The hypothesised model was tested using AMOS 20 (Arbuckle, 2010), with maximum likelihood estimation. As SEM requires a complete data set for each case (Bryne, 2010), the recommendations of Graham (2009) were followed by using multiple imputation methods to estimate the missing values. Four cases had missing data on up to 12 per cent of the items; the remainder of the participants had missing values on a very low number of items (0% to 2.2%).

SEM is most useful when analysing a relatively small set of variables. As the number of variables increases, the likelihood of finding an improper solution increases and the model is unlikely to fit the data (Bentler & Chou, 1987; Harris & Schaubroeck, 1991). Accordingly, Bentler and Chou (1987) and Harris and Schaubroeck, (1991) recommend

using up to about 20 observed variables. To reduce the number of observed variables in this study, the recommendations of Bagozzi and Heatherton (1994) were followed by calculating composite scores for the need satisfaction component of the model. These composite variables were used as the observed indicators for the need satisfaction latent variable. Moreover, to reduce the total number of job crafting items, we first ran a CFA and dropped the poorest loading indicator for each latent variable. This process reduced the number of observed variables in the analysis to 22 in total.

In order to test the fit of the hypothesised model, the two-step approach recommended by Anderson and Gerbing (1988) was followed. First, to confirm that the observed variables were satisfactorily related to their respective latent variables, CFAs were performed for the measurement model component of the analysis. In the CFA, the factor loadings of one observed variable for each latent variable was set to 1.0, which established the metric of the latent variables. Correlations were allowed between the pairs of latent variables shown in the structural model in Figure 1, and correlations between other variables were fixed to 0.0. Second, the fit of the structural model was tested. Path coefficients were determined for each of the hypothesised paths in the model, and the relations between other pairs of variables were set to 0.0.

Fit Indices

To test the fit of the measurement and structural models, six fit indices were used. The recommendations of Marsh, Balla, and Hau (1996) and Jaccard and Wan (1996) were followed by a) using multiple fit indices, and b) using fit indices across a range of different classes of fit indices. Hence, three relative goodness of fit indices were used, including the non normed fit index (NNFI; Tucker & Lewis, 1973), the Comparative Fit Index (CFI; Bentler, 1990), and the Incremental Fit Index (IFI; Bentler & Bonnet, 1980). The chi square statistic, the normed chi square, which is the chi square/*df* ratio (χ^2/df), and the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993) were also used. Values above .90 for the NNFI and IFI (Byrne, 1994), as well as values above .93 for the CFI indicate a good fit (Hu & Bentler, 1992). Although there is no clear guideline for the χ^2/df ratio, values from as low as 2 (Ullman, 2007) to as high as 5 (Wheaton, Muthen, Alwin, & Summers, 1977) have been recommended as indicating good fit. A value of 3 is another guideline (Bollen, 1989; Kline, 2005), and this was the criteria chosen for the present study to be consistent with previous job crafting research (e.g., Tims et al., 2012). For RMSEA, values less than .08 indicate acceptable fit (Browne & Cudeck, 1993), and values greater than .10 should lead to model rejection (Cudeck & Browne, 1993; MacCallum, Browne, & Sugawara, 1996). Although a non-significant

chi square statistic is indicative of good fit, it is important to consider this index in light of the other fit indices, as it is easily affected by sample size and the size of the correlations in the model (Kline, 2005; Meyers, Gamst, & Guarino, 2006).

Results

Preliminary Analyses

The intercorrelations between the study variables are shown in Table 1. Composite scores were calculated for the variables by adding the items used in the scale and dividing them by the total number of items for that variable.

Insert Table 1 about here

As shown in Table 1, the 16 correlations between the job crafting variables and the need satisfaction (mediator) variables were highly significant. Similarly, the eight correlations between the job crafting variables and the well-being (outcome) variables were also significant. Finally, the correlations between the need satisfaction variables and the well-being variables were also significant. All correlations are in the

expected (positive) direction. The pattern of correlations was therefore consistent with the hypothesised model depicted in Figure 1.

Several further analyses were conducted to determine whether any of the sample demographics were related to the variables in the model. Correlations revealed that neither years of formal education nor level of income were related to the variables in the model (all p's > .05). Gender differences, however, were detected. T-tests revealed that female participants reported a statistically significant higher mean for relational crafting (M = 3.89) than male participants (M = 3.35), a higher mean on the satisfaction of the relatedness need (M = 5.30) than male participants (M = 4.76), and a higher mean for both PWB (M = 4.48) and SWB (M = 4.65) than male participants (M = 4.16 and M = 4.25 for PWB and SWB, respectively). Logistic regression also revealed that gender was significantly related to all relational crafting items, the relatedness composite variable, two SWB items (SWB items 1 and 3; all p's < .05) and to two PWB items (PWB items 2 and 3; all p's < .05). To acknowledge these relationships in the hypothesised structural model, gender was inserted as an antecedent observed variable with directional paths to the variables to which it is uniquely related. Hence, directional paths were drawn from gender to all relational crafting items, the relatedness need composite variable, as well as the SWB and PWB latent variables. These relationships can be observed in Figure 2.

Most of the estimation methods used in SEM assume multivariate normality (Ullman, 2007). Although AMOS revealed this assumption was violated with the current data set, it is important to note that such violations tend to make it more difficult to produce a well fitting model (Anderson & Gerbing, 1988; Byrne, 2010). Moreover, maximum likelihood parameter estimates in moderately sized samples are generally robust against violations of multivariate normality (Browne, 1984). The main problem is that it may inflate the significance of the parameters in the model (e.g., Bryne, 2010). Hence, to correct for this violation, an adjustment was undertaken on the significance level of the parameters in the model. Instead of the accepted level of $\alpha = .05$, the current analyses were conducted according to a more rigorous criteria of $\alpha = .01$.

The Hypothesised Model

First, CFA was used to test the measurement model. The CFA results indicated that although the chi square index was significant, on the whole the fit of the measurement model was good. Specifically, the chi square ($df = 204$) was 406.05 ($p < .001$), the χ^2/df was 1.99, the NNFI was .92, the IFI was .94, the CFI was .94, and the RMSEA was .06. Next, the full structural model shown in Figure 1 was tested, with the addition of a gender antecedent variable. Only the latent variables are shown in this diagram. Absence of an arrow connecting variables in the model implies

a lack of a hypothesised direct effect. The fit statistics for the full structural model are shown in the top row of Table 2.

The hypothesised mediation model was tested against seven alternative models. This procedure was followed to test whether job crafting was actually the optimum antecedent condition that is associated with the motivational mediation process—psychological need satisfaction—which, in turn, predicts well-being. A plausible alternative model, for example, could place need satisfaction as the antecedent (motivating) variable in the model – where psychological need satisfaction predicts job crafting activities, which, in turn, predict well-being. Yet another alternative model could place well-being as the antecedent variable. Hence, a model with three constructs can be tested in six different ways by interchanging the three constructs as antecedents, mediators, and outcome variables. If the hypothesised model were to fit the data better than these alternative models, it provides increased confidence that the ordering of the hypothesised interrelationships is correct. Moreover, as an empirical consensus about whether PWB actually leads to SWB has not yet been reached, we tested the hypothesised model against another alternative model ($M6_{alternative}$) with no specified relationship between PWB and SWB. Finally, the hypothesised model was tested against the null model, which assumes that all the observed variables in the model—and hence all the latent

variables—are uncorrelated (Byrne, 2010). Importantly, mediation analyses (Barron & Kenny, 1986) have been identified as the optimum method to provide insight about the underlying mechanisms that explain how one variable predicts changes in another. Hence, it was expected that need satisfaction was the underlying mechanism that explains how job crafting predicts changes in well-being. It was of less interest how need satisfaction affected the relationship between job crafting and well-being, which would be tested with moderation. As such, all models in the current study were different variations of models testing mediation hypotheses.

Table 2 shows the hypothesised model compared to the alterative models.

Insert Table 2 about here

As can be observed in Table 2, although the chi-square statistic was significant, on the whole the fit of the hypothesised structural model was good. The NNFI and IFI were both above the criterion values of .90, and the CFI was above .93. The χ^2/df ratio was less than 3, and the RMSEA was less than .08. Table 2 also shows that although the alternative

models generally provided a reasonable fit to the data, the hypothesised model fit the data better on every fit index. This includes the chi-square index, which, as noted, was significant for all models. Importantly, however, the hypothesised model produced the lowest chi-square value compared to all alternative models, providing yet further support for the hypothesised direction of the interrelationships. Although the hypothesised model produced an IFI value that was equivalent to one alternative model (JC to WB to Needs), this was nonetheless better than all other alternative models. It is also worth noting that the hypothesised model fit the data substantially better than the null model. Taken together, these results offer support for the hypothesised relationships predicted in our model. Importantly, these fit statistics were produced without the need for model respecification. The modification indices suggested that some error terms could be co-varied to enhance the model fit, however, as there was no robust theoretical rationale for correlating the error terms in this analysis, an *a priori* decision was made not to use this approach to enhance the model fit.

Insert Figure 2 about here

Figure 2 presents the full structural model deemed to fit the data. Ovals represent latent variables and rectangles represent observed variables. An inspection of the direct effects shows that task crafting had the strongest relationship with need satisfaction (.33), followed by relational crafting (.31) and cognitive crafting (.19). Intrinsic need satisfaction had the strongest relationship with PWB (.67) and had a weak to moderate correlation with SWB (.22). The direct relationship between PWB and SWB was strong (.71). All relationships were statistically significant at $p < .001$, except the path between cognitive crafting and intrinsic need satisfaction, which reached significance at the $p < .01$ level.

Gender exhibited moderate to strong relationships with the relational crafting observed variables (from .35 to .79), moderate relationships with the relatedness composite variable (.38), and weak relationships with PWB (.18) and SWB (.06). All of these paths are significant at $p < .001$, except for Gender to rc4 ($p < .05$), and Gender to PWB and SWB both failed to reach statistical significance (*p's* > .05). All other relationships were significant at $p < .01$. Given that all hypothesised paths in the model are significant at the adjusted $\alpha = .01$ level, there can be confidence that the significance of the relationships in the model is correct.

The effect of intervening variables was examined using the standardised indirect effects matrices. Cognitive crafting exhibited

indirect effects on PWB and SWB through need satisfaction (both .13). Relational crafting exhibited indirect effects on PWB and SWB through need satisfaction (both .19). Task crafting also exhibited indirect effects on PWB and SWB through need satisfaction (.23 and .22 for PWB and SWB respectively). Also of interest here was the indirect effect of need satisfaction on SWB, through PWB. The matrices showed that need satisfaction predicted SWB through PWB (.43), which is moderately strong. These indirect effects statistics support the intervening variables in the model by showing that increases in the antecedent variables are associated with corresponding increases the outcome variables, through increases in an indirect, mediating variable.

Overall, the analyses indicated that the data fit the model well. Task, relational, and cognitive forms of job crafting predicted intrinsic need satisfaction, which, in turn, predicted SWB and PWB. Moreover, need satisfaction predicted SWB both directly and through changes in PWB.

Discussion

There has been a dearth of empirical research seeking to understand the relationships between individual outcomes and job crafting in organisations, and hence little research into the theoretical mechanisms that underlie these relationships. The aim of the present study was to address this gap by testing a model of job crafting, self-determination,

and employee well-being in work organisations. Specifically, it was hypothesised that job crafting would predict psychological need satisfaction, which, in turn, would predict employee well-being.

The data revealed that the hypothesised structural model fit the data well in a sample of working adults, even without the need for model respecification. Moreover, the hypothesised model fit the data better than all of the alternative models. This indicates that the extent to which employees engaged in job crafting predicted the extent to which their psychological needs were satisfied on the job, which, in turn, predicted their level of SWB and PWB. Also as predicted, SWB was enhanced both directly through the three needs and indirectly through changes in PWB. This supports the arguments of, for example, Ryan and Deci (2001; Ryan, Huta, & Deci, 2008; Ryff, 1989; Ryff & Singer, 1998) that eudaimonic living, as represented by PWB, affects the pleasurable, hedonic component of well-being through strivings toward optimal functioning, self-actualisation and, more broadly, a life well lived. The present study thus suggests that although the pursuit of positive functioning is sometimes not pleasurable in itself, it ultimately results in enhanced meaning and fulfillment, and hence predicts an enhanced state of subjective well-being.

The results of this study should be interpreted in light of some limitations. First, the sample was relatively homogenous in terms of education, nationality, and income. This is probably because most participants worked in the white collar sector in Australia where the average salary and level of education are typically higher than the blue collar sector or public service. Hence, the mean income and level of education of the participants was higher than the average found in most industrialised societies. This impedes the external validity of the findings to more diverse groups of workers, such as those in the traditional blue collar sector and those from other cultures. Moreover, the measures were circulated primarily throughout the human resources departments in two of the three organisations (accounting for 12.4 per cent of the total sample) – a sector that generally attracts and contains higher numbers of female than male employees (Pichler, Simpson, & Stroh, 2008; Sayce, 2012). Females also generally respond with greater frequency to survey research (Gosling, Vazire, Srivastava, & John, 2004), which may account for the higher number of females in the present study. Second, the sample, although large enough to use SEM methods for the analysis, was not large enough to conduct an invariance test on a separate sample of participants. An invariance test would help to determine whether the model is sustainable across the wider adult working population. One further avenue for potential research would be to test the invariance of the

model against working adults from a different culture. There is a body of research to suggest that the intrinsic needs are universal across cultures (e.g., Deci et al., 2001; Deci & Ryan, 2000; Sheldon, Abad, & Omoile, 2009; Sheldon, Elliot, Kim, & Kasser, 2001; Vansteenkiste, Lens, Soenens, & Luyckz, 2006), however, it remains unknown whether the relatively individual act of crafting ones work will predict need satisfaction, and, in turn, well-being in other cultures where work groups, dynamics, and expectations of employees are different to Australia. Although this would not confirm the universal significance of the model, it would provide valuable evidence of its generalisability beyond the work culture in corporate Australia. Moreover, the model should be further explored and tested on larger samples that cut across varying levels of employee income, class, industries, and job sectors (i.e., blue-collar and white-collar employees). Future expansions of the model could draw on these varying population groups to provide further evidence of its validity and potential universality.

Third, the job crafting measure used in this analysis is in the early stages of development and only preliminary tests of its construct validity have been conducted. Nonetheless, preliminary testing has shown promising results for the measure's internal consistency, as well as its factor structure, convergent, and discriminant validity (Slemp & Vella-

Brodrick, 2012). Fourth, there is the problem of shared method variance – variance attributed to the measurement method rather than the constructs the measures represent (Podsakoff, Mackenzie, & Podsakoff, 2003). Although the order of presentation of questionnaires was counterbalanced in this study to reduce this problem, future research could go a step further by using a different methodology, such as the multitrait-multimethod approach, or to statistically control for it directly. Fifth, the data here are cross-sectional and hence do not allow for inferences to be made about job crafting behaviours over time. It is possible, for example, that the accumulation of job crafting experiences over time will exhibit stronger relationships with employee needs and well-being. We were not able to test this longitudinal hypothesis with our cross-sectional data and future research should examine the effect of job crafting over time to address this gap. Finally, the outcome measure used in this study consists solely of well-being, which is a subjective measure. Future research would benefit from the analysis of objective measures in their research that are indicative of well-being or performance, such as absenteeism or turnover.

Despite these limitations, the present study furthers job crafting research in two important ways. First, the data established an association between job crafting activities and the broader conceptualisation of

employee well-being, including both hedonic and eudaimonic features. Other than the work of Nielsen and Abildgaard (2012), Tims et al. (2012), and Petrou et al. (2012), previous research on job crafting lacked an empirical basis, and the effect of job crafting activities for employees remained nothing more than theoretical predictions. The data here shows empirically that the extent to which employees craft their jobs predicts indices of well-being. Lyubomirsky, Sheldon, and Schade's (2005) 'architecture of sustainable change' model purports that well-being is governed by three important antecedents: genetics and heritably, life circumstances, and intentional activities, which account for 50 percent, 10 percent, and 40 percent of the variance in well-being, respectively. The present study suggests that job crafting represents another form of intentional activity that people can adopt to improve their well-being. In contrast to the intentional activities identified by Lyubomirsky et al., however, job crafting is more specific to the workplace and thus constitutes a unique form of activity that people can use in a work specific setting to improve their well-being.

The second way the present study extends job crafting research is by identifying that job crafting activities predict changes in employee well-being through changes in satisfying intrinsic human needs; needs purported to be universal to all humans (Deci et al., 2001; Deci & Ryan,

2000; Sheldon, Abad, & Omoile, 2009). This suggests that job crafting allows employees to internalise their work behaviours so as to form a congruence between their work-related activities and their intrinsic desires, interests, and values. Hence, job crafting allows employees to shape their work experience within the boundaries of their jobs to increase their enjoyment or satisfaction, connect with more people at work, and to appreciate the effect their work is having on the success of the organisation, community, or society. These experiences align closely with the needs for autonomy, relatedness, and competence, respectively. The present study supports these relationships by showing that the extent to which employees engage in job crafting predicts the extent to which their intrinsic needs are satisfied at work.

The present study also supports research showing need satisfaction to be related to well-being (e.g., Ilardi et al., 1993; Reis et al., 2000; Sheldon & Elliot, 1999; Sheldon, Ryan, & Reis, 1996). However, our model extends this research by also including a measure of PWB, which has been largely neglected in the operationalisation of well-being in prior empirical research, particularly in work contexts. Moreover, the relationships obtained here show that need satisfaction is more strongly related to PWB than SWB. This makes sense given that PWB is concerned with strivings towards optimal functioning and self-

actualisation, whereas SWB is concerned with the pursuit and attainment of happiness and pleasure. Need satisfaction, similarly to PWB, is concerned with the human trajectory toward vitality, integration, and health (Deci & Ryan, 1985, 2000). Insofar as one's intrinsic needs are satisfied, they will move towards these pursuits, and hence towards PWB. The model also shows that the extent to which one enhances their PWB will produce corresponding increases in SWB. Ultimately, by satisfying one's needs at work, one will move towards an enhanced state of mental health that is characterised by both positive functioning and happiness. Job crafting, as discussed, is one important way by which employees may satisfy their needs at work.

It should be noted that males and females responded differently to several variables under investigation. Namely, females reported higher levels of relational crafting, greater satisfaction of the need for relatedness, and higher SWB and PWB than male participants. However, neither path from gender to SWB or PWB was statistically significant when considered in light of other relationships in the model using the parameter estimates. Nonetheless, although hypotheses about the temporal sequencing of events cannot be tested with the present cross-sectional data set, it is possible that a direct consequence for the higher levels of relational crafting in females is a contributing factor to their

increased satisfaction for their need for relatedness, and consequently, their heightened well-being. This is an interesting finding that warrants further examination using longitudinal methods, which may ultimately shed light on whether this possibility is correct.

In conclusion, the present study provides empirical evidence for a relationship between job crafting and employee mental health. More specifically, the results suggest that the extent to which employees engage in job crafting predicts the satisfaction of their intrinsic needs, which, in turn, predicts employee well-being. Job crafting, then, appears a promising concept upon which an intervention aimed at enhancing employee well-being could be based. Wellman and Spreitzer (2011) recently published an incubator article in the *Journal of Organizational Behavior* to encourage organisational scholars to use job crafting activities to enhance the meaning they attain from their work. A job crafting intervention could use a similar procedure, and hence focus on encouraging employees to think about the range of opportunities, techniques, and applications they might use to engage in job crafting activities at work. Given the regrettable state of the current global economic climate, such an intervention may provide employees with a welcome tool they can use to potentially enhance their mental health.

Acknowledgements

The authors would like to thank Dr Simon Albrecht and Dr Simon Moss of Monash University, who offered valuable statistical insight and advice that greatly assisted the research.

References

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, *103*, 411–423. doi: 10.1037/ 0033-2909.103.3.411

Arbuckle, J. L. (2010). *IBM SPSS® Amos™ 19 User's Guide*. Chicago, SPSS Inc.

Baard, P. P., Deci, E. L., Ryan, R. M. (2004). Intrinsic need satisfaction: A motivational basis of performance and well-being in two work settings. *Journal of Applied Social Psychology*, *34*, 2045–2068. doi: 10.1111/j.1559-1816.2004.tb02690.x

Bagozzi, R., & Heatherton, T. (1994). A general approach to representing multifaceted personality constructs: Application to self-esteem. *Structural Equation Modeling*, *1*, 35–67. doi: 10.1080/10705519409539961

Barron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology*, *51*, 1173–1182. doi: 10.1037/0022-3514.51.6.1173

Bentler, P. M. (1990). Comparative fit indexes in structural models. *Psychological Bulletin*, *88*, 588–606. doi: 10.1037/0033-2909.107.2.238

Bentler, P. M., & Bonett, D. G. (1980). Significance tests and goodness of fit in the analysis of covariance structures. *Psychological Bulletin, 88,* 588–606. doi: 10.1037/0033-2909.88.3.588

Bentler, P. M., & Chou, G. (1987). Practical issues in structural modeling. *Sociological Methods and Research*, *16,* 78–117. doi: 10.1177/0049124187016001004

Berg, J. M., Grant, A. M., & Johnson, V. (2010). When callings are calling: Crafting work and leisure in pursuit of unanswered occupational callings. *Organization Science*, *21*, 973–994. doi:10.1287/orsc.1090.0497

Berg, J. M., Wrzesniewski, A., & Dutton, J. E. (2010). Perceiving and responding to challenges in job crafting at different ranks: When proactivity requires adaptivity. *Journal of Organizational Behavior*, *31,* 158–186. doi: 10.1002/job.645

Browne, M. W. (1984). Asymptotically distribution-free methods for the analysis of covariance structures. *British Journal of Mathematical and Statistical Psychology*, *37*, 62–82. doi: 10.1111/j.2044-8317.1984.tb00789.x

Browne, M. W., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. A. Bollen & J. S. Long (Eds.), *Testing structural equation models* (pp. 136–162). Newbury Park, CA: Sage Publications.

Byrne, B. M. (1994). *Structural equation modeling with EQS and EQS/Windows*. Thousand Oaks, CA: Sage Publications.

Byrne, B. M. (2010). *Structural Equation Modeling with AMOS: Basic Concepts, Applications, and Programming (2nd Ed.).* New York, NY: Taylor and Francis Group.

Cudeck, R., & Browne, M. W. (1993). Alternative ways of assessing model fit. In K. A. Bollen, & J. Scott Long (Eds.), *Testing structural equation models* (pp. 1–9). Newbury Park, CA: Sage Publications.

Deci, E. L., & Ryan, R. M. (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.

Deci, E. L., & Ryan, R. M. (2000). The "What" and "Why" of goal pursuits: Human needs and self determination of behavior. *Psychological Inquiry*, *11*, 227–268. doi: 10.1207/S1532 7965PLI1104_01

Deci, E. L., & Ryan, R. M. (2008). Hedonia, Eudaimonia, and well-being: An introduction. *Journal of Happiness Studies*, *9*, 1–11. doi: 10.1007/s10902-006-9018-1

Deci, E. L., Ryan, R. M., Gagné, M., Leone, D. R., Usunov, J., & Kornazheva, B. P. (2001). Need satisfaction, motivation, and well-being in the work organizations of a former Eastern Bloc Country: A cross-cultural examination of self-determination. *Personality and Social Psychology Bulletin, 27*, 930–942. doi: 10.1177/0146167201278002

Diener, E. (2000). Subjective well-being: The science of happiness and a proposal for a national index. *American Psychologist, 55*, 34–43. doi: 10.1037/0003-066X.55.1.34

Diener, E., Suh, M. E., Lucas, R. E., Smith, H. L. (1999). Subjective well-being: Three decades of research. *Psychological Bulletin*, *125*, 276–302. doi: 10.1037/0033-2909.125.2.276

Fried, Y., Grant, A. M., Levi, A. S., Hadani, M., Slowik, L. H. (2007). Job design in temporal context: A career dynamics perspective. *Journal of Organizational Behavior*, *28*, 911 – 927. doi: 10.1002/job.486

Ghitulescu, B. (2006). Job crafting and social embeddedness at work. Unpublished doctoral dissertation, University of Pittsburgh.

Gosling, S. D., Vazire, S., Srivastava, S., & John, O. P. (2004). Should we trust web-based studies? A comparative analysis of six preconceptions about Internet questionnaires. *American Psychologist*, *59*, 93–104. doi: 10.1037/0003-066X.59.2.93

Graham, J. W. (2009). Missing data analysis: Making it work in the real world. *Annual Review of Psychology*, *60*, 549–576. doi: 10.1146/annurev.psych.58.110405.085530

Grant, A. M., & Ashford, S. J. (2008). The dynamics of proactivity at work. *Research in Organizational Behavior*, *28*, 3–34. doi:10.1016/j.riob.2008.04.002

Grant, A. M., Parker, S., & Collins, C. (2009). Getting credit for proactive behavior: Supervisor reactions depend on what you value and how you feel. *Personnel Psychology*, *62*, 31–55. doi: 10.1111/j.1744-6570.2008.01128.x

Harris, M. M., & Schaubroeck, J. (1991). Confirmatory modeling in organizational behavior/human resource management: Issues and applications. *Journal of Management*, *16*, 337–360. doi: 10.1177/014920639001600206

Howell, R. T., Chenot, D., Hill, G., & Howell, C. J. (2011). Momentary happiness: The role of psychological need satisfaction. *Journal of Happiness Studies*, *12*, 1–15. doi: 10.1007/s10902-009-9166-1

Hu, L-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, *6*, 1–55. doi: 10.1080/10705519909540118

Ilardi, B. C., Leone, D., Kasser, T., & Ryan, R. M. (1993). Employee and supervisor ratings of motivation: Main effects and discrepancies associated with job satisfaction and adjustment in a factory setting. *Journal of Applied Social Psychology*, *23*, 1789–1805. doi: 10.1111/j.1559-1816.1993.tb01066.x

Jaccard, J., & Wan, C. K. (1996). *LISREL approaches to interaction effects in multiple regression.* Thousand Oaks, CA: Sage Publications.

Kashdan, T. B., Biswas-Diener, R., & King, L. A. (2008). Reconsidering happiness: The costs of distinguishing between hedonics and eudaimonia. *Journal of Positive Psychology, 3*, 219–233. doi: 10.1080/17439760802303044

Keyes, C. L. M. (2007). Promoting and protecting mental health as flourishing: A complementary strategy for improving national mental health. *American Psychologist*, *62*, 95–108. doi: 10.1037/0003-066X.62.2.95

Keyes, C. L. M., Shmotkin, D., & Ryff, C. D. (2002). The empirical encounter of two traditions. *Journal of Personality and Social Psychology*, *82*, 1007–1022. doi: 10.1037/0022-3514.82.6.1007

Keyes, C. L. M., Wissing, M., Potgieter, J. P., Temane, M., Kruger, A., & van Rooy, S. (2008). Evaluation of the Mental Health Continuum – Short Form (MHC-SF) in Setswana-speaking South Africans.

Clinical Psychology & Psychotherapy, *15*, 181–192. doi: 10.1002/cpp.572

Kline, R. B. (2005). *Principles and Practice of Structural Equation Modeling (2nd Ed.).* New York, NY: Guilford.

Leana, C., Appelbaum, E., & Shevchuk, I. (2009). Work process and quality of care in early childhood education: The role of job crafting. *Academy of Management Journal*, *52*, 1169–1192.

Linley, P. A., Maltby, J., Wood, A. M., Osborne, G., & Hurling, R. (2009). Measuring happiness: The higher order factor structure of subjective and psychological well-being measures. *Personality and Individual Differences*, *47*, 878–884. doi:10.1016/j.paid. 2009.07.010

Linley, P. A., Nielson, K. M., Gillett, R., & Biswas-Diener, R. (2010). Using signature strengths in the pursuit of goals: Effects on goal progress, need satisfaction, and well-being, and implications for coaching psychologists. *International Coaching Psychology Review*, *5*, 8–17.

Little, R. J., & Rubin, D. B. (2002). *Statistical analysis with missing data* (2nd ed.). Hoboken, NJ: Wiley-Interscience.

Lyons, P. (2008). The crafting of jobs and individual differences. *Journal of Business and Psychology*, *23*, 25–36. doi: 10.1007/s10869-008-9080-2

Lyubomirsky, S., Sheldon, K. M., & Schkade, D. (2005). Pursuing happiness: The architecture of sustainable change. *Review of General Psychology*, *9*, 111–131. doi: 10.1037/1089-2680.9.2.111

MacCallum, R. C., Browne, M. W., & Sugawara, H. M. (1996). Power analysis and determination of sample size for covariance structure modelling. *Psychological Methods*, *1*, 130–149. doi: 10.1037/1082-989X.1.2.130

Markiewicz, D., Devine, I., & Kausilas, D. (2000). Friendships of women and men at work: Job satisfaction and resource implications. *Journal of Managerial Psychology*, *15*, 161–184. doi: 10.1108/02683940010310346

Marsh, H. W., Balla, J. R., & Hau, K. T. (1996). An evaluation of incremental fit indexes: A clarification of mathematical and empirical properties. In G. A. Marcoulides & R. E. Schumacker (Eds.), *Advanced structural equation modeling techniques* (pp. 315–353). Mahwah , NJ: Lawrence Erlbaum.

Meyers, L. S., Gamst, G., & Guarino, A. J. (2006). *Applied multivariate research: Design and interpretation.* Thousand Oaks, CA: Sage.

Nielsen, K., & Abildgaard, J. S., (2012). The development and validation of a job crafting measure for use with blue-collar workers. *Work &*

Stress: An International Journal of Work, Health, & Organisations, *26*, 365–384. http://dx.doi.org/10.1080/02678373.2012.733543

Page, K. M., & Vella-Brodrick, D. A. (2009). The 'What', 'Why', and 'How' of employee well-being: A new model. *Social Indicators Research*, *90*, 441–458. doi: 10.1007/s11205-008-9270-3

Petrou, P., Demerouti, E., Peeters, M. C. W., Schaufeli, W. B., & Hetland, J. (2012). Crafting a job on a daily basis: Contextual correlates and the link to work engagement. *Journal of Organizational Behavior*. doi: 10.1002/job

Pichler, S., Simpson, P. A., & Stroh, L. K. (2008). The glass ceiling in human resources: Exploring the link between women's representation in management and the practices of strategic human resource management and employee involvement. *Human Resource Management*, *47*, 463–479. doi: 10.1002/hrm.20227

Pierce, J. L., & Gardiner, D. G. (2004). Self-esteem within the work and organizational context: A review of the organization-based self-esteem literature. *Journal of Management*, *30*, 591–622. doi: org/10.1016/j.jm.2003.10.001

Podsakoff, P. M., MacKenzie, S. B., & Podsakoff, N. P. (2003). Common method biases in behavioral research: A critical review of the

literature and recommended remedies. *Journal of Applied Psychology*, *88*, 879–903. doi: 10.1037/0021-9010.88.5.879

Pratt, M. G., Rockmann, K. W., & Kaufmann, J. B. (2006). Constructing professional identity: The role of work and identity learning circles in the customization of identity among medical residents. *Academy of Management Journal*, *49*, 235–262. doi: 10.5465/AMJ.2006.20786060

Reis, H. T., Sheldon, K. M., Gable, S. L., Roscoe, J., & Ryan, R. M. (2000). Daily well-being: The role of autonomy, competence, and relatedness. *Personality and Social Psychology Bulletin*, *26*, 419–435. doi: 10.1177/0146167200266002

Ryan, R. M., & Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and wellbeing. *American Psychologist*, *55*, 68–78. doi: 10.1037/0003-066X.55.1.68

Ryan, R. M., & Deci, E. L. (2001). On happiness and human potentials: A review of research on hedonic and eudaimonic well-being. *Annual Review of Psychology*, *52*, 141–166. doi: 10.1146/annurev.psych.52.1.141

Ryan, R. M., Huta, V., & Deci, E. L. (2008). Living well: A self-determination theory perspective on eudaimonia. *Journal of Happiness Studies*, *9*, 139–170. doi: 10.1007/s10902-006-9023-4

Ryff, C. D. (1989). Happiness is everything, or is it? Explorations on the meaning of psychological well-being. *Journal of Personality and Social Psychology*, *57*, 1069–1081. doi: 10.1037/0022-3514.57.6.1069

Ryff, C. D., & Keyes, C. L. M. (1995). The structure of psychological well-being revisited. *Journal of Personality and Social Psychology*, *69*, 719–727. doi: 10.1037/0022-3514.69.4.719

Ryff, C. D., & Singer, B. (1998). The contours of positive human health. *Psychology Inquiry*, *9*, 1–28. doi:10.1207/s15327965pli0901_1

Sayce, S. (2012). Being a female pension trustee. *Equality, Diversity, and Inclusion: An International Journal*, *31*, 298–314. Doi: 10.1108/02610151211209135

Seibert, S. E., Kraimer, M. L., Crant, J. M. (2001). What do proactive people do? A longitudinal model linking proactive personality and career success. *Personnel Psychology*, *54*, 845–874. doi: 10.1111/j.1744-6570.2001.tb00234.x

Sheldon, K. M., Abad, N., & Omoile, J. (2009). Testing self-determination theory via Nigerian and Indian adolescents. *International Journal of Behavioral Development*, *33*, 451–459. doi: 10.1177/0165025409340095

Sheldon, K. M., & Elliot, A. J. (1999). Goal striving, need satisfaction, and longitudinal well-being: The self-concordance model. *Journal of*

Personality and Social Psychology, *76*, 482–497. doi: 10.1037/0022-3514.76.3.482

Sheldon, K. M., Elliot, A. J., Kim, Y., & Kasser, T. (2001). What's satisfying about satisfying events? Comparing ten candidate psychological needs. *Journal of Personality and Social Psychology, 80*, 325–339. doi: 10.1037//0022-3514.80.2.325

Sheldon, K. M., & Filak, V. (2008). Manipulating autonomy, competence, and relatedness support in a game-learning context: New evidence that all three needs matter. *British Journal of Social Psychology*, *47*, 267–283. doi: 10.1348/014466607X238797

Sheldon, K. M., Ryan, R. M., & Reis, H. T. (1996). What makes for a good day? Competence and autonomy in the day and in the person. *Personality and Social Psychology Bulletin*, *22*, 1270 – 1279. doi: 10.1177/01461672962212007

Slemp, G. S., & Vella-Brodrick, D. A. (2012). Job crafting: The development and validation of a new scale. Manuscript submitted for publication.

Thompson, J. A. (2005). Proactive personality and job performance: A social capital perspective. *Journal of Applied Psychology, 90*, 1011–1017. doi: 10.1037/0021-9010.90.5.1011

Tims, M., Bakker, A. B., & Derks, D. (2012). Development and validation of the job crafting scale. *Journal of Vocational Behavior, 80*, 173–186. doi: 10.1016/j.jvb.2011.05.009

Tucker, L. R., & Lewis, C. (1973). A reliability coefficient for maximum likelihood factor analysis. *Psychometrika*, *38*, 1–10. doi: 10.1007/BF02291170

Ullman, J. B. (2007). Structural equation modeling. In B. G. Tabachnick & L. S. Fidell (Eds.), *Using Multivariate Statistics* (5th ed., pp. 676–780.). New York, NY: Pearson Education, Inc.

Van Scotter, J., Motowidlo, S. J., Cross, T. C. (2000). Effects of task performance and contextual performance on systemic rewards. *Journal of Applied Psychology, 85,* 526–535. doi: 10.1037/0021-9010.85.4.526

Vansteenkiste, M., Lens, W., Soenens, B., & Luyckz, K. (2006). Autonomy and relatedness among Chinese Sojourners and applicants: Conflictual or independent predictors of well-being and adjustment? *Motivation and Emotion, 30,* 273–282. doi: 10.1007/s11031-006-9041-x

Waterman, A. S. (2008). Reconsidering happiness: A eudaimonist's perspective. *Journal of Positive Psychology*, *3*, 234–252. doi: 10.1080/17439760802303002

Wellman, N., & Spreitzer, G. (2011). Crafting scholarly life: Strategies for creating meaning in academic careers. *Journal of Organizational Behavior*, *32*, 927–931. doi: 10.1002/job.708

Wheaton, B., Muthen, B., Alwin, D. F., & Summers, G. (1977). Assessing Reliability and Stability in Panel Models. *Sociological Methodology*, *8*, 84 – 136.

Wrzesniewski, A., McCauley, C., Rozin, P., & Schwarz, B. (1997). Jobs, careers, and callings: People's relations to their work. *Journal of Research in Personality*, *31*, 21–33.

Wrzesniewski, A., & Dutton, J. E. (2001). Crafting a job: Revisioning employees as active crafters of their work. *Academy of Management Review*, *26*, 179–201.

Appendix A

The Job Crafting Questionnaire

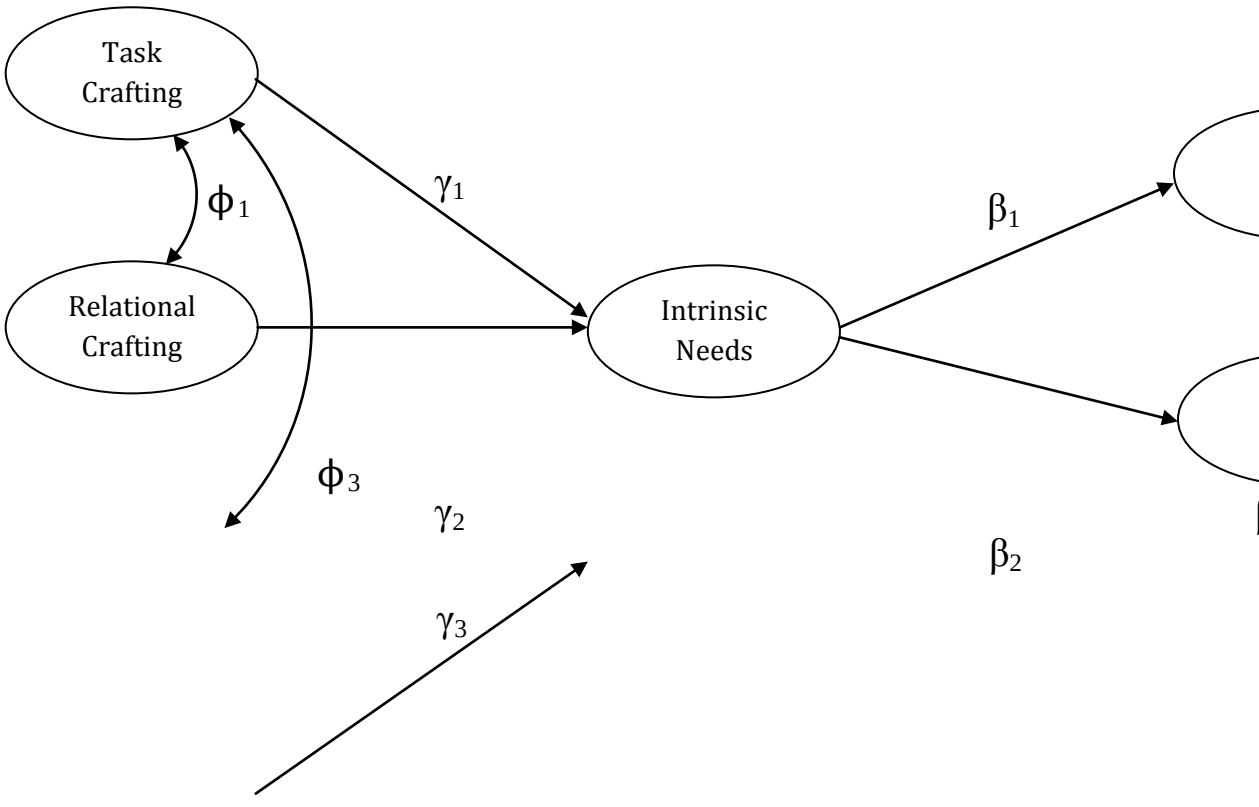
Employees are frequently presented with opportunities to make their work more engaging and fulfilling. These opportunities might be as simple as making subtle changes to your work tasks to increase your enjoyment, creating opportunities to connect with more people at work, or simply trying to view your job in a new way to make it more purposeful. While some jobs will provide more of these opportunities than others, there will be situations in all jobs where one can make subtle changes to make it more engaging and fulfilling.

Please indicate the extent to which you engage in the following behaviours by indicating a 1 (hardly ever) to 6 (very often).

	Item
	Task Crafting
1	Introduce new approaches to improve your work*
2	Change the scope or types of tasks that you complete at work
3	Introduce new work tasks that you think better suit your skills or interests
4	Choose to take on additional tasks at work
5	Give preference to work tasks that suit your skills or interests
	Cognitive Crafting
6	Think about how your job gives your life purpose
7	Remind yourself about the significance

	your work has for the success of the organisation
8	Remind yourself of the importance of your work for the broader community
9	Think about the ways in which your work positively impacts your life
10	Reflect on the role your job has for your overall well-being
	Relational Crafting
11	Make an effort to get to know people well at work
12	Organise or attend work related social functions
13	Organise special events in the workplace (e.g., celebrating a co-worker's birthday)*
14	Choose to mentor new employees (officially or unofficially)
15	Make friends with people at work who have similar skills or interests

* Item adapted from Leana, Appelbaum, and Shevchuk (2009)



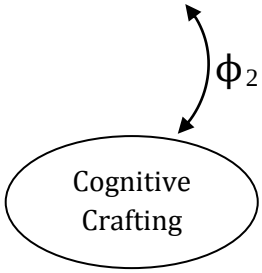


Figure 1. Hypothesised model showing the anticipated relations between job crafting, intrinsic need satisfaction, and well-being.

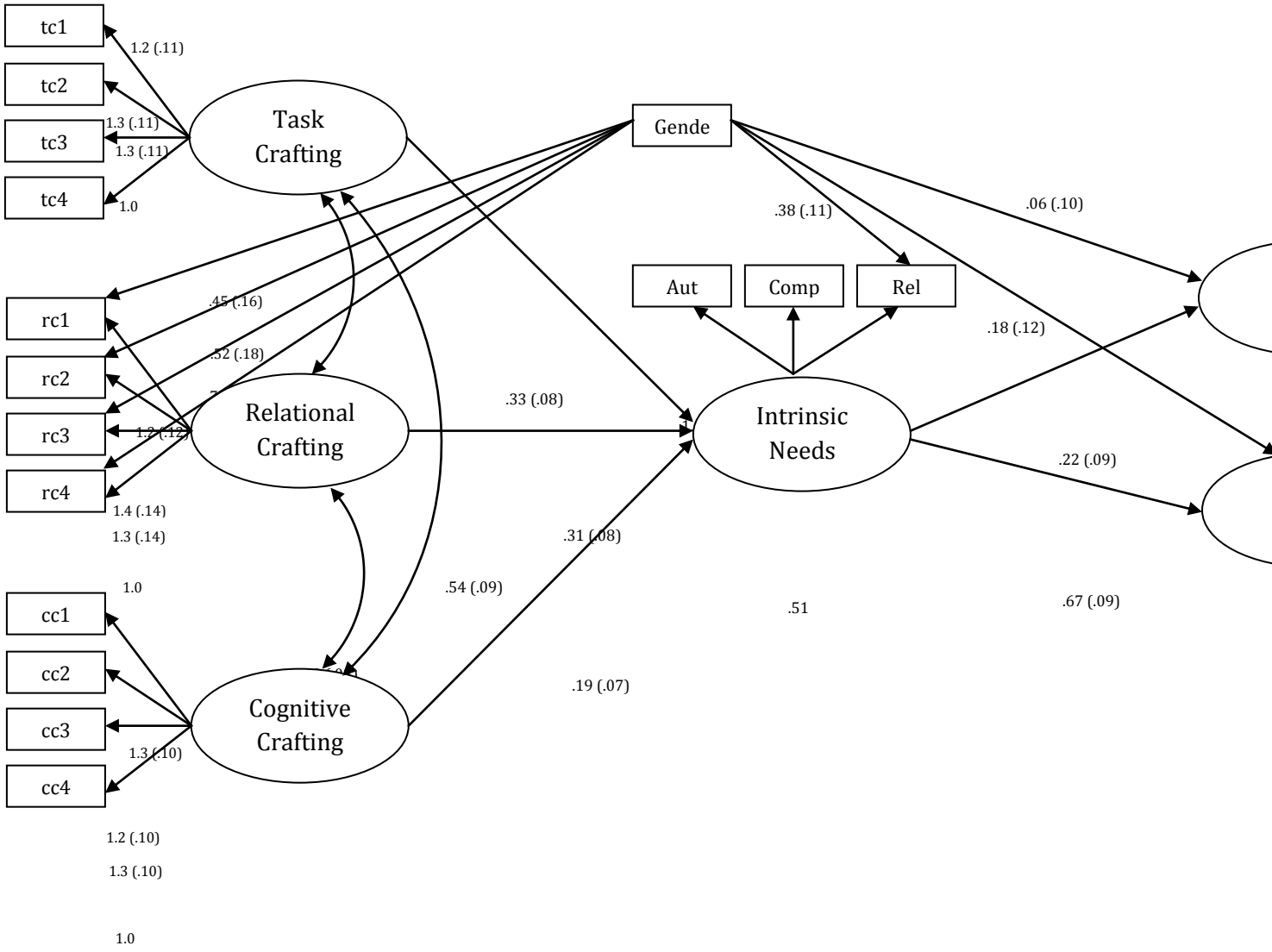


Figure 2. Parameter estimates for the full structural model using AMOS.

Note: Measurement error terms are shown in parentheses. Absence of an error term indicates an item with a loading fixed to 1.0 to set the metric of the latent variable. All path and measurement coefficients are significant at $p < .001$, except the paths from cognitive crafting to intrinsic needs ($p < .01$), Gender to rc4 ($p < .05$), and Gender to PWB and SWB (both *p's* > .05); Chi square = 438.22 ($p < .001$), $\chi^2/df = 2.04$, non-normed fit index = .92, incremental fit index = .93, comparative fit index = .93, and root mean square error of approximation = .06; Aut = Autonomy, Comp = Competence, Rel = Relatedness, SWB = Subjective Well-Being, PWB = Psychological Well-Being.

Table 1

Correlation matrix of the constructs used in the study

Construct	1	2	3	4	5	6	7	8	9
1. Task crafting									
2. Relational crafting	.52**								
3. Cognitive crafting	.64**	.53**							
4. TJC	.86**	.82**	.85**						
5. Need for autonomy	.54**	.31**	.44**	.51**					
6. Need for competence	.65**	.41**	.49**	.55**	.65**				
7. Need for relatedness	.32**	.51**	.45**	.45**	.56**	.52**			
8. TWNS	.52**	.48**	.49**	.59**	.87**	.83**	.83**		
9. SWB	.39**	.32**	.41**	.44**	.48**	.51**	.39**	.53**	
10. PWB	.43**	.49**	.40**	.52**	.37**	.45**	.42**	.49**	.68**

Note: TJC = Total Job Crafting, TWNS = Total Work Need Satisfaction, SWB = Subjective Well-Being, PWB = Psychological Well-Being;
* *p < .05*
** *p < .01*

Table 2

The SEM fit indices of the hypothesised model against the alternative models and the null model

Model	χ^2	*df*	χ^2/df	NNFI	IFI	CFI	RMSEA
Hypothesised model	438.22***	215	2.04	.92	.93	.93	.06
JC to WB to Needs	457.50***	212	2.16	.91	.93	.92	.07
Needs to JC to WB	477.66***	214	2.23	.90	.92	.92	.07
Needs to WB to JC	481.80***	217	2.22	.90	.92	.92	.07
WB to Needs to JC	470.26***	220	2.14	.91	.92	.92	.07
WB to JC to Needs	506.01***	216	2.34	.90	.91	.91	.07
$M6_{alternative}$	504.13***	216	2.33	.90	.91	.91	.07
Null	3476.45***	253	13.74	-	-	-	.22

Note: χ^2 = Chi square, χ^2/df = normed chi square, NNFI = Non normed fit index, IFI = Incremental fit index, CFI = Comparative fit index, RMSEA = Root mean square error of approximation, JC = Job Crafting, WB = Well-Being, Needs = Psychological Need Satisfaction.

* $p < .05$

** $p < .01$

*** $p < .001$