



The job crafting questionnaire: A new scale to measure the extent to which employees engage in job crafting

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Abstract: Empirical research on employee job crafting is scarce, probably because until recently scales with which the construct can be reliably and validly measured were not available. Although a general scale has recently been developed, the cognitive component of job crafting was omitted. The aim of the present study was to address this gap by developing and validating the 15-item Job Crafting Questionnaire (JCQ). The sample consisted of 334 employees who completed a battery of questionnaires, including the JCQ. Exploratory and confirmatory factor analyses both supported a three-factor structure that reflected the task, relational, and cognitive forms of job crafting originally presented by Wrzesniewski and Dutton (2001). Convergent analyses showed the JCQ correlated positively with indices of proactive behaviour (i.e., organisational citizenship behaviour, strengths use, and self-concordant goal setting), and positive work functioning (i.e., job satisfaction, work contentment, work enthusiasm, and positive affect). These analyses also showed the measure correlated inversely with negative affect. Reliability analyses indicated the measure has high internal consistency. Together, the analyses supported the reliability and validity of the JCQ and it shows good promise as a measure to progress research on job crafting.

Keywords: job crafting, task crafting, relational crafting, cognitive crafting, scale development, wellbeing

1. Introduction

Practitioners are frequently briefed with the task of enhancing employee satisfaction, wellbeing, and performance. Although some interventions have successfully improved contextual or job characteristics (Kluger & DeNisi, 1996; Parker, Chmiel & Wall, 1997; Wall, Kemp, Jackson & Clegg, 1986), an alternative avenue is to focus on behaviour-based change (e.g., Black, 2001; Seligman, Steen, Park & Peterson, 2005). A focus on employee characteristics such as behaviour or cognitions is promising not only because it can yield important individual outcomes related to wellbeing, but also because such characteristics benefit organisations (e.g., Harter, Schmidt, & Keyes, 2003; Hodges & Clifton, 2004). Job crafting is a promising yet relatively unexplored approach that, potentially, employees can use to heighten their job satisfaction and wellbeing (Wrzesniewski & Dutton, 2001).

Job crafting is described as the ways in which employees take an active role in initiating changes to the physical, cognitive, or social features of their jobs. It is an informal process that workers use to shape their work practice so that it aligns with their idiosyncratic interests and values. In this way, job crafting is a form of proactive behaviour, driven by employees rather than management (Grant & Ashford, 2008). In their original conceptualisation of the construct, Wrzesniewski and Dutton (2001) argued for the existence of three forms of job crafting. Task



crafting refers to initiating changes in 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 whom one interacts with at work (e.g., making friends with people with similar skills or interests). Cognitive crafting is distinct from task and relational crafting in that it involves altering how one 'sees' one's job, with the view to making it more personally meaningful (e.g., making an effort to recognise the effect one's work has on the success of the organisation or community). In initiating task, relational, and cognitive changes to one's job boundaries, the meaning of the job and the identity of the employee also change accordingly.

Job crafting shows promise as an effective workplace intervention because it requires employees to adopt an active role in shaping their work experience. It recognises that although employees are typically not able to redesign their jobs, there will be opportunities in the context of almost any job where employees can initiate changes to tasks, interactions, or ways they think about their work to make it more personally meaningful or enjoyable. Job crafting, then, can be applied across a variety of roles with different levels of seniority and degrees of autonomy (Berg, Wrzesniewski, & Dutton, 2010; Wrzesniewski & Dutton, 2001), and hence it is plausible that even in the most restricted and routine jobs employees are able to initiate changes to influence their work experience. The literature also attests to the organisational benefits of employee proactive behaviour. Studies have shown, for example, that proactive employees display better performance, progress their careers at a faster rate, and are generally paid more (Grant, Parker, & Collins, 2009; Seibert, Kraimer, & Crant, 2001; Thompson, 2005; Van Scotter, Motowildo, & Cross, 2000).

Despite job crafting being a promising basis for workplace interventions, it has received surprisingly little research attention. This gap in the literature might stem from the fact that, until recently, few measures of the construct were available. Indeed, with few exceptions, the vast majority of the research on job crafting 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) and there remains an important need to assess empirically the relationships between job crafting and other employee outcomes.

1.1 Previous efforts to develop a measure of job crafting

Although there have been some efforts to develop measures of job crafting, their contexts are generally limited. Ghitulescu (2006) and Leana, Appelbaum, and Shevchuk (2009), for example, developed measures of job crafting that were highly specific to their populations of interest—manufacturers and teachers, respectively—and hence contain items specifically targeted towards these two occupation groups. Although rigorously constructed and useful for their respective populations, these scales are not appropriate for empirical research with more general working populations. This includes those employees from the regular private or public sectors, whose jobs traditionally involve a high degree of autonomy and hence considerable scope for implementing job-crafting behaviours.

Only recently has a more general scale for job crafting been published. This scale, developed by Tims, Bakker, and Derks (2012), consists of four dimensions representing four different types of job crafting: increasing social job resources, increasing structural job resources, increasing challenging job demands, and decreasing hindering job demands. In this way, similar to their previous work (e.g., Tims & Bakker, 2010), these authors frame their conceptualisation of job crafting within the Job Demands-Resources (JD-R) model (Bakker & Demerouti, 2007; Demerouti, Bakker, Nachreiner, & Schaufeli, 2000, 2001), which posits that job characteristics can be categorised into two opposing classes: job demands and job resources. Job

demands consist of those physical, social, or organisational aspects of jobs that require sustained mental and physical effort, and are thus associated with psychological costs such as burnout and exhaustion. Examples of job demands include work-load and time pressures (Demerouti et al., 2000). Job resources are those physical, social or organisational characteristics of jobs that aid the achievement of work goals or stimulate personal growth or development (Demerouti et al., 2001). Examples of job resources are performance feedback and task variety (Demerouti et al., 2000). Job resources are therefore an important buffer to the psychological costs associated with job demands (Bakker, Demerouti, & Euwema, 2005; Bakker, Hakanen, Demerouti & Xanthopoulou, 2007). Tims et al. (2012) suggest that job crafting reflects the changes that employees make to balance their job demands and job resources with their personal needs and abilities. Framed within the JD-R model, then, job crafting is a process by which employees seek to maximise their job resources and minimise their job demands.

1.2 The importance of cognitive crafting

Tims et al. (2012) made a practical and creative contribution by framing their job crafting scale within the JD-R model and, indeed, many types of job crafting behaviours are attempts to increase job resources and decrease job demands. Moreover, this scale has since been used and adapted for further research by Petrou, Demerouti, Peeters, Schaufeli, and Hetland (2012) and Nielsen and Abildgaard (2012). However, we argue that a measure of job crafting that directly addresses the cognitive component of job crafting is also needed. This is because crafting cognitions about work is an important way in which individuals can shape their work experience (Wrzesniewski & Dutton, 2001). It also permits another avenue from which to exert some influence over one's job and may suit particular types of jobs or employees. Moreover, it allows employees to appreciate the broader effects of their work and to recognise the value that their job may hold in their life.

Cognitive crafting is perhaps the facet of job crafting that aligns most closely to "work identity", which is essentially how people define or perceive themselves at work (Bartel & Dutton, 2001; Wrzesniewski & Dutton, 2001). According to Wrzesniewski and Dutton (2001), a large part of one's work identity is cognitive, in that it helps people realise a more global conception of themselves at work, where they can make claims about what work is and what it is not. While one's work identity cannot be changed at will, employees can make claims about who they are as employees and why their work matters. These claims form the identity that each employee creates for himself or herself at work and ultimately changes the personal meaning that is reflected in their work more generally. Wrzesniewski and Dutton (2001) cite a hypothetical scenario about physicians who alter the way in which they cognitively frame their job. Physicians, as providers of health services, can view their work in several ways. For example, they might frame work about healing people into heightened states of positive physical wellbeing. Alternatively, they might frame work about acting upon illness, disease, or injury to merely keep people alive and functioning with the technology and equipment available to them. Through cognitive crafting, employees can alter the way in which they see their work in order to obtain a more positive work identity, and ultimately derive an enhanced level of meaning and purpose from their work. It is our view that a measure of job crafting needs to include this important component of job crafting.

Although some items of the Tims et al. (2012) scale are focussed on reducing the psychological and emotional costs of hindering job demands (e.g., "I make sure my work is mentally less intense"; "I try to ensure my work is emotionally less intense"), it remains unclear whether these items refer to employee behaviour or employee cognitions. For example,

employees could make their work emotionally less intense by changing their workplace behaviours (e.g., working on projects that are less emotionally draining; seeking more help from others), or in contrast, by changing their cognitions (e.g., thinking about how one's job gives value to one's life as a whole; thinking about the aspects of one's job that are emotionally rewarding). It is important for a scale of job crafting to assess the cognitive component of the construct as doing so will enable researchers to investigate the full range of antecedents and consequences for each dimension. It will also allow researchers to examine several more specific questions about job crafting. For example, a new scale will allow researchers to investigate whether the cognitive component of job crafting explains as much variance in important employee outcomes as the other, more behavioural, components of task and relational crafting. It may also shed light on where certain types of job crafting fit in temporal sequence. It is possible, for example, that cognitive crafting precedes the more behavioural attempts to craft work, perhaps because cognitive crafting may be implemented more quickly and with less discretionary effort than the more behavioural activities of relational and task crafting. Finally, it is currently unknown whether all three forms of job crafting need to be demonstrated in order to produce lasting changes in employee outcomes. A new scale which includes clear dimensions on all three forms will allow scholars to examine these important research questions.

1.3 Aim and hypotheses

Although job crafting is a conceptually appealing concept on which to design employee-based interventions, until recently there has been little effort to establish a quantitative measure of the construct that can be used in psychological research. Only recently have findings begun to emerge that suggest job crafting is an important predictor of important employee outcomes, such as work engagement, cynicism, employability, performance ratings, and job satisfaction (Nielsen & Abildgaard, 2012; Petrou et al., 2012; Tims et al., 2012). Beyond these studies however, there has been a dearth of research into the empirical relationships between job crafting and employee outcomes. There has been even less research examining the relationship between cognitive crafting and employee outcomes. The aim of this study is therefore to develop the Job Crafting Questionnaire (JCQ). The JCQ is designed to measure the original types of activities that represented job crafting and is hence consistent with Wrzesniewski and Dutton's (2001) original model of job crafting that includes task, relational, and cognitive forms of job crafting. These three types of activities represent three distinct yet meaningful ways in which employees can shape their work experience. Thus, it was hypothesised:

Hypothesis 1: The JCQ items load on three dimensions that represent task, relational, and cognitive forms of job crafting, and this model will fit the data better than will a single-factor model.

Another aim of the present study was to examine the convergent validity of the JCQ by correlating the job-crafting dimensions with other theoretically related constructs. As job crafting has been described as a form of discretionary behaviour that is driven by the employee rather than by management (e.g., Grant & Ashford, 2008), it was anticipated that all dimensions of the JCQ would be positively correlated with other self-initiated proactive behaviours that employees can exhibit at work to enhance their enjoyment or performance. Thus, it was hypothesised:

Hypothesis 2: There is a positive relationship between the JCQ and employees' tendency to engage in organisational citizenship behaviour (OCB) – a form of discretionary behaviour that promotes the effective functioning of the organisation (Organ, 1988). This prediction was made,

as similar to OCB, job crafting is a form of discretionary behaviour that employees initiate at work to change their work experience.

Hypothesis 3: There is a positive relationship between the JCQ and employees' strengths' use. This prediction is made as using one's strengths at work could potentially be considered a special form of task crafting, whereby employees select those tasks in which they are more skilled, experienced, or for which they hold more natural talent. Hence, it is likely that employees who use their strengths at work are also likely to see themselves as active job crafters.

Hypothesis 4: There is a positive relationship between the JCQ and setting intrinsically motivated (i.e., self-concordant; Sheldon & Elliot, 1999) work-related goals. This prediction is made because intrinsically motivated goals are those that are consistent with employees' inherent interests and values. Job-crafting activities are initiated so employees can make subtle changes to their roles in order to enhance these intrinsic work qualities. Thus, employees who are motivated by the intrinsic enjoyment and satisfaction that their work brings are likely to engage in job crafting, which is a method by which employees have the potential to enhance these intrinsic features of their job by ultimately making their work more consistent with their personal interests, skills, and desires.

Given that job crafting is a form of self-initiated behaviour that employees use to make their work more meaningful and enjoyable, it was further hypothesised that the JCQ would be related to other work-specific emotions and cognitions. Hence, it was hypothesised:

Hypothesis 5: There is a positive relationship between the JCQ and the constructs of employee job satisfaction, work contentment, work enthusiasm, and work-specific positive affect.

Hypothesis 6: For the same reason it was hypothesised that the JCQ is negatively related to work-specific negative affect.

2. Method

2.1 Participants

Data from a sample of 334 employees were included in the quantitative analysis, which involved both exploratory factor analysis (EFA) and confirmatory factor analysis (CFA) of the scale items. This sample was recruited through various means, including social networking sites, online discussion forums, and through staff email and newsletters of organisations that had agreed to invite their staff to participate. All participants were at least 18 years of age and were in paid employment. The invitations directed participants to an explanatory statement that contained a link to the questionnaires. Participation in this study was voluntary.

Because the JCQ was a part of a larger battery of psychological questionnaires, many participants dropped out after having completed the items related to job crafting, thus limiting the demographics information to 253 participants in total (75.7%). These complete cases were used in the convergent analyses, where the complete data set was needed. 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). Of the complete cases, more than half 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. Most employees worked in education (68.0%), followed by banking and financial services (6.4%), and healthcare (6.0%). The mean income was AUD76,371 per annum, and the mean years of education was 17.60 (SD = 3.56).

2.2 Scale construction

The questions were developed to measure the extent to which employees engaged in the types of activities that were consistent with Wrzesniewski and Dutton's (2001) original model of job-crafting that consisted of task, relational, and cognitive forms of crafting. Most items were original but four items were adapted from Leana et al. (2009), who developed a measure of job crafting specifically for teachers in education settings. Their scale consisted of the task and relational forms of crafting (at both the individual and group level), but omitted the cognitive form of crafting. Only those items that were adaptable to more general working environments were selected from this scale, and were altered for appropriate use with more general working samples by removing any reference to education or classroom-based environments. These items provided theoretically consistent examples of ways in which employees might engage in task or relational crafting at work and were hence incorporated into the present study. All items that were developed to measure the extent to which employees engage in cognitive crafting in the present study were original.

By reviewing the extant literature on what constituted the types of activities that represented job crafting, as well as examining the existing measures of job crafting, a preliminary set of 27 items was developed and administered to a separate sample of 23 working adults for qualitative analysis. These participants were known to the researcher and provided feedback about items they deemed to be clear and thus which should be retained, and also items they deemed to be confusing and which should be either eliminated or reworded. They also provided feedback about whether each item made sense within a general working context. Based on this analysis, a final set of 21 items was retained for the EFA and CFA components of the study. Upon consultation with the participants who provided feedback, four of these 21 items were also reworded to enhance clarity and relevance to suit more general working samples. The final set of 21 items consisted of seven items for each of task, relational, and cognitive forms of job crafting.

The job-crafting questionnaire was introduced with the following statement: "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." Participants were then instructed to indicate the extent to which they engaged in each job-crafting behaviour or cognition on a Likert-type scale from 1 (hardly ever) to 6 (very often).

2.3 Procedure

Once the preliminary set of 21 items was developed and adjusted based on participant feedback, it was administered to a working sample for quantitative analysis. The majority of the sample was invited to participate through the organisation for which they worked. These organisations consisted of a large Australian university, a large Australian banking and finance company, and a large Australian health insurance company. In each case, an organisational representative sent an email to the employees inviting staff to participate. It was made known to participants that they could choose not to participate and that their managers would never gain access to their responses. The remaining participants were recruited through advertisements on social networking sites and online discussion forums. All participants were offered the choice to enter a lottery to win an 8GB iPod touch as an incentive. The initial email

or advertisement contained a link to the study explanatory statement, which then directed participants to the questionnaires. The set of questionnaires was counterbalanced to ensure that the order of presentation of each questionnaire was not the same for the entire sample.

2.4 Overview of statistical analyses

Analyses were conducted in four steps. First, an EFA was conducted on the scale items. Following this a CFA was undertaken. The internal consistency, as well as the convergent validity of the scale were then examined. The methods used in the four steps are described in detail below.

Step 1: Exploratory factor analysis. In the first stage, an EFA was conducted to determine a workable factor structure. Of the total 334 participants, a sub-sample of 151 participants was randomly selected using the randomisation function of SPSS 19. An EFA with maximum likelihood extraction was then conducted on this sub-sample to determine the factor structure of the 21 job-crafting items. Due to previous literature indicating a threshold loading of .40 (Gorsuch, 1983), items that did not meet this cutoff, as well as items that cross-loaded on multiple factors, were dropped one at a time. This process was repeated until the solution showed a simple structure (Thurstone, 1947), and all items met the inclusion criteria.

Step 2: Confirmatory factor analysis. Using AMOS 19 (Arbuckle, 2010), a CFA was subsequently conducted on the remaining 183 participants of the total sample to determine whether the factor structure required modification. The CFA was used to confirm the exploratory model, and if possible, to refine the model using a separate sample of participants. CFA is a form of structural equation modelling that is used to determine the goodness of fit between a hypothesised factor structure and the sample data. Decisions concerning whether or not to add a path in the model are determined by a combination of logical, theoretical and empirical indications. Modification indices are the empirical indicators used by AMOS to suggest paths that will improve the fit of the model. This often involves allowing the error terms of various items in the model to be correlated. However, it was determined a priori that in the effort to keep the model theory driven rather than empirically driven, a more theoretically justifiable procedure was to exclude problematic items (Levine, Hullett, Turner & Lapinski, 2006). Problematic items were defined as those with highly correlated error terms and/or those which loaded on the wrong factor. Further, not permitting correlations between error terms increases the chances that the factor structure will replicate across samples (Byrne, 2010).

In the CFA, the factor loading of one indicator variable to each latent variable was fixed to 1.0. This established the metric of each latent variable. Correlations were allowed between the pairs of latent variables in the model, as theoretically, different types of job-crafting behaviours should be related to each other. Correlations between other variables were fixed to 0.0.

To assess model fit, we followed the recommendation of Marsh, Balla, and Hau (1996) by using multiple fit indices. Moreover, as per the recommendations of Jaccard and Wan (1996), a range of fit indices across different classes of fit indices was used. Hence, five indices guided our assessment of model fit: chi square/df ratio (χ^2/df), the Non Normed Fit Index (NNFI; Tucker & Lewis, 1973), the Comparative Fit Index (CFI; Bentler, 1990), the Incremental Fit Index (Bentler & Bonnet, 1980), and the Root Mean Square Error of Approximation (RMSEA; Browne & Cudeck, 1993). Values of .90 for the NNFI and IFI (Byrne, 1994) indicate good fit. Although the recommended CFI values range from .90 to .95, generally values close to or approaching .95 are more accepted as indicating good fit (Hu & Bentler, 1999). The χ^2/df ratio provides an estimate of model fit that is less sensitive to sample size than the regular chi square index.

Although there is no clear guideline for the χ^2/df ratio, values from 2 (Ullman, 2007) to as high as 5 (Wheaton, Muthen, Alwin & Summers, 1977) have been recommended as appropriate cut-offs. A value of 3 is another guideline (Bollen, 1989; Kline, 2005), and this was the value selected to ensure consistency with previous job-crafting research (e.g., Tims et al., 2012). The RMSEA takes into account the error of approximation in the population and tests how well the model would fit the population covariance matrix if it were available (Byrne, 2010). Values less than .08 indicate reasonable fit (Browne & Cudeck, 1993), and values less than .05 indicate a good fit (Stieger, 1990). Values greater than 1.0 should lead to model rejection (Browne & Cudeck, 1993; MacCallum, Browne, & Sugawara, 1996). The chi-square test statistic was not used as an index of model fit because it is likely to reject a good fitting model due to trivial differences between the correlations and the covariances in the observed and predicted matrices (Meyers, Gamst & Guarino, 2006).

Step 3: Reliability analysis. Internal consistency was assessed by computing Cronbach's alphas for the job-crafting dimensions, as well as the total scale. These estimates were calculated before and after the factor analysis stage where items were dropped. Although alpha estimates provide limited practical information about a measure when used in isolation, when used in combination with EFA and CFA they can be useful in supporting the reliability of a scale after its multi-dimensionality has been confirmed (Levine et al., 2006).

Step 4: Convergent analyses. To assess convergent validity, the JCQ was correlated with other constructs with which it should theoretically be related. The measures that were used in these analyses are detailed in the following section.

2.5 Measures

Job crafting. Job crafting was measured with the final JCQ developed in this study (see Appendix). The complete measure consisted of 15 items and participants indicate the frequency with which they have engaged in each job-crafting activity from 1 (hardly ever) to 6 (very often).

Strengths use. The extent to which participants used their strengths was assessed with Govindji and Linley's (2007) 14-item Strengths Use Scale. An example item is "My work gives me lots of opportunities to use my strengths". Participants indicate the extent to which they agree with each statement from 1 (strongly disagree) to 7 (strongly agree). These authors reported a Cronbach's alpha of .95. An equivalent reliability (.95) was found with the current study's data set. Govindji and Linley (2007) found the items to load on a single 'strengths use' factor. Moreover, the scale correlated moderately to strongly with self-efficacy (.63), self-esteem (.56), subjective wellbeing (.51), psychological wellbeing (.56), and subjective vitality (.45), supporting its validity.

Intrinsic goal striving. Participants were asked to list two work-related goals and we then used the same method as Emmons (1986), as well as Sheldon and colleagues (e.g., Sheldon & Elliot, 1999; Sheldon & Lyubomirsky, 2006), to calculate the extent to which these goals were intrinsically motivated. This procedure requests participants to list a work-related goal and subsequently rate whether it is pursued for external motivations (pursued to please others or for rewards), introjected motivations (striving to avoid guilt or self-criticism), identified motivation (pursued due to internal values or beliefs) and intrinsic motivation (pursued due to the intrinsic enjoyment and satisfaction from the task or goal itself). Participants rated the extent to which both goals were pursued for each of the four reasons by responding on a seven-point scale from 1 (not at all for this reason) to 7 (completely for this reason). As in past research (e.g., Sheldon & Elliot, 1999; Sheldon & Houser-Marko, 2001; Sheldon & Lyubomirsky,

2006) an intrinsic motivation score was then calculated by averaging the intrinsic and identified ratings, and subtracting the averaged external and introjected ratings for each goal. This scale had satisfactory reliability with a Cronbach's alpha of .74 for the current study's data set.

Organisational citizenship behaviour (OCB). OCB was assessed with the 13-item Podsakoff, Ahearne, and MacKenzie (1997) scale, which measures the helping, civic virtue, and sportsmanship components of OCBs. An example item is "I help out others if they fall behind in their work". Participants respond from 1 (strongly disagree) to 5 (strongly agree). Podsakoff et al. (1997) reported alpha coefficients of .95, .96, and .88 for the three components respectively. The full scale alpha coefficient using the current study's data is lower but still satisfactory (.79). Podsakoff et al. (1997) also showed the measure predicted work group performance, thus lending some support for the scale's validity.

Job satisfaction. The Michigan Organizational Assessment Questionnaire (Cammann, Fichman, Jenkins & Klesh, 1979) was used to measure job satisfaction. An example item is "All in all, I am satisfied with my job", and participants respond from 1 (strongly disagree) to 7 (strongly agree). Cammann et al. (1979) reported a Cronbach's alpha of .77 and in the present study it was .90. Moreover, Bruck, Allen and Spector (2002) showed that scores on the job satisfaction scale can be predicted from work-family conflict.

Affective wellbeing. Affective wellbeing was measured with the Warr (1990) affective wellbeing scales. Six descriptor words were used to describe the anxiety-contentment axis (e.g., "Relaxed" for Positive Affect, "Tense" for Negative Affect) and the depression-enthusiasm axis ("Cheerful" for Positive Affect, "Miserable" for Negative Affect) of affective wellbeing. Participants indicated the frequency with which they had experienced each emotion at work on a 6-point scale from 1 (never) to 6 (all of the time). The scale had high internal consistency, with Cronbach's alphas of .90 for the anxiety-contentment axis and .91 for the depression-enthusiasm axis. Warr (1990) found that contentment was positively related to job satisfaction and motivation (.21 and .20, respectively) and negatively related to work overload and distress (-.40 and -.46, respectively). Similarly, enthusiasm was positively related to job satisfaction and motivation (both .40), and negatively related to task repetition and distress (-.22 and -.39 respectively), supporting the scale's validity.

Warr's (1990) affective wellbeing scales were also used to measure work-specific positive affect (WSPA) and negative affect (WSNA). WSPA and WSNA were measured by calculating an average score for the six items that reflected both PA and NA in Warr's (1990) affective wellbeing measure. This scale also had high internal consistency, with Cronbach's alphas of .92 and .93 for WSPA and WSNA, respectively.

3. Results

3.1 Exploratory factor analysis (N = 150)

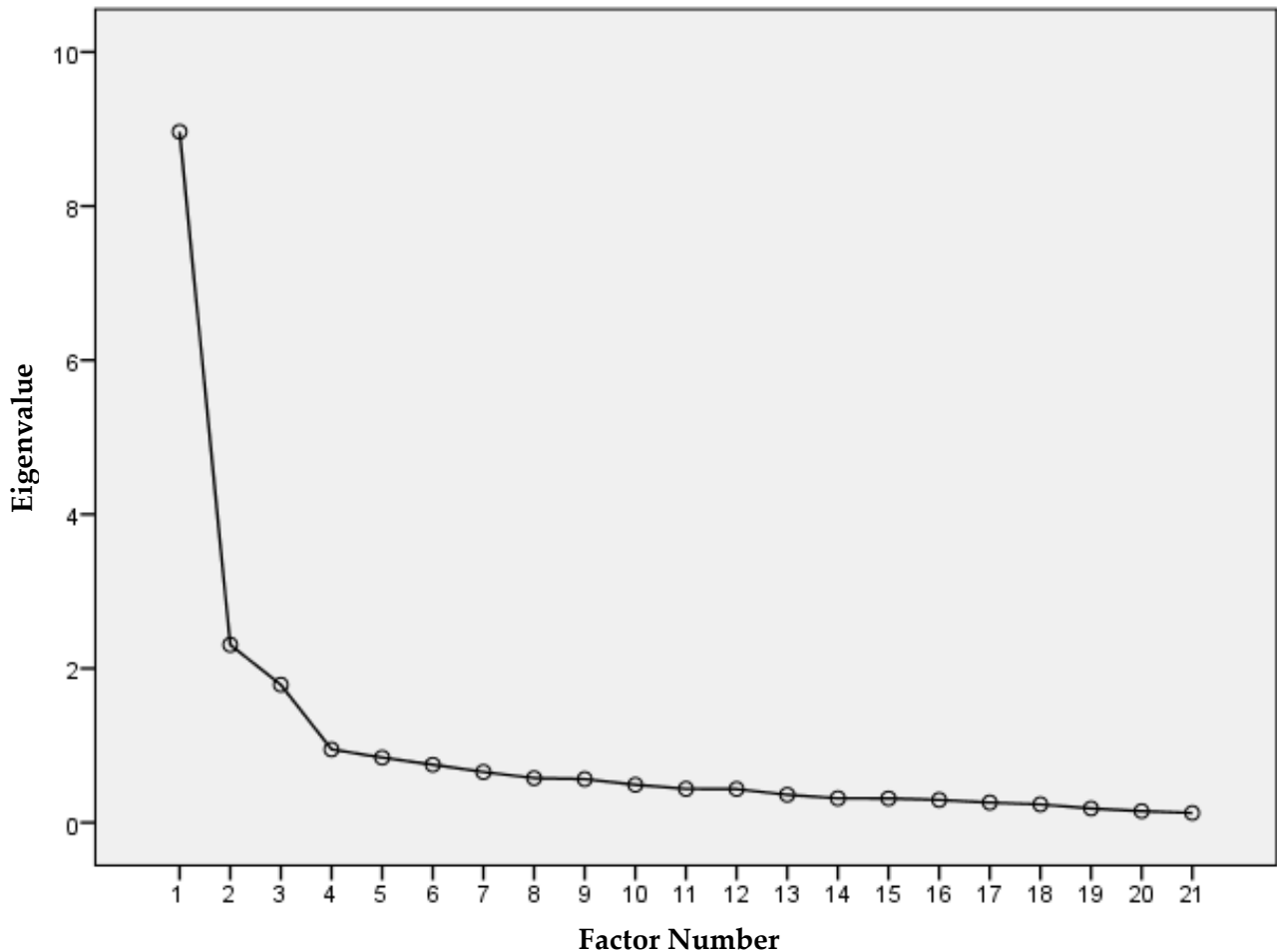
EFA with maximum likelihood extraction and oblique rotation in SPSS 19 was used to determine if the factor structure of the 21 items was consistent with the original model of job crafting (Wrzesniewski & Dutton, 2001). One case was missing most of its data for the job-crafting items. This case was dropped listwise, leaving data from 150 participants for the analysis. The remainder of the missing values for each item was very low (0.0% to 2.0%), and multiple imputation methods (three imputations with SPSS) were used to estimate these values (Little & Rubin, 2002).

Prior to performing the EFA, the suitability of data for factor analysis was assessed. Inspection of the correlation matrix revealed many coefficients of .3 and above. The Kaiser-Meyer-Olkin value was .89, exceeding the recommended value of .6 (Kaiser, 1970, 1974).

Bartlett's Test of Sphericity was statistically significant, supporting the factorability of the correlation matrix (Bartlett, 1954).

Maximum likelihood extraction revealed the presence of three factors with eigenvalues exceeding 1. These factors explained 40.45% (eigenvalue = 8.96), 8.58% (eigenvalue = 2.31), and 7.19% (eigenvalue = 1.79) of the variance respectively. Figure 1 shows the scree plot and a break after the third factor.

Figure 1. Scree plot showing a break after the third factor



An inspection of the screeplot revealed a break after the third factor, and Catell's (1966) scree test indicated a three-factor solution for further investigation. This was further supported by a parallel analysis, which showed three factors with eigenvalues exceeding the corresponding criterion values for a randomly generated data matrix of equivalent size (21 variables \times 150 cases).

The three-factor solution explained a total of 56.23% of the variance. To aid in the interpretation of these three factors, direct oblimin rotation was performed. The rotated factor solution resembled a simple structure, with all three factors showing several strong loadings. Those items that exhibited a cross loading or loaded greater than .35 on the wrong factor were deleted. Due to previous literature suggesting a threshold for factor loadings of .40 (Gorsuch, 1983), items that did not meet this cutoff were dropped. On this basis, two of the items for cognitive crafting were deleted. Another EFA was performed and a solution consisting of 19

items was retained, with a clear simple structure present in the data (Thurstone, 1947). These data are presented in Table 1. There were moderate to strong correlations between the three factors (from .42 to .57), supporting the use of oblique rotation.

Table 1: Items, means, standard deviations, and factor loadings of the three-factor Job Crafting Questionnaire

Item	M	SD	Factor		
			1	2	3
<i>Task Crafting</i>					
1 Introduce new approaches to improve your work*	3.94	1.48	.75		
2 Change the scope or types of tasks that you complete at work	3.54	1.47	.92		
3 Introduce new work tasks that better suit your skills or interests	3.42	1.47	.86		
4 Choose to take on additional tasks at work	4.12	1.34	.58		
5 Give preference to work tasks that suit your skills or interests	4.09	1.39	.59		
6 Change the way you do your job to make it more enjoyable for yourself*	3.73	1.39	.74		
7 Change minor procedures that you think are not productive*	3.91	1.35	.66		
<i>Cognitive Crafting</i>					
8 Think about how your job gives your life purpose	3.69	1.46		.87	
9 Remind yourself about the significance your work has for the success of the organisation	3.48	1.41		.66	
10 Remind yourself of the importance of your work for the broader community	3.45	1.53		.81	
11 Think about the ways in which your work positively impacts your life	3.66	1.43		.85	
12 Reflect on the role your job has for your overall well-being	3.96	1.33		.69	
<i>Relational Crafting</i>					
13 Engage in networking activities to establish more relationships	3.68	1.48			.45
14 Make an effort to get to know people well at work	4.24	1.24			.77
15 Organise or attend work related social functions	3.39	1.56			.77
16 Organise special events in the workplace (e.g., celebrating a co-worker's birthday)*	3.16	1.61			.82
17 Introduce yourself to co-workers, customers, or clients you have not met	3.95	1.37			.65
18 Choose to mentor new employees (officially or unofficially)	3.48	1.51			.58
19 Make friends with people at work who have similar skills or interests	4.09	1.33			.62

* indicates items that were adapted or taken from Leana, Appelbaum, and Shevchuk (2009).

Taken together, the results of the EFA support a three-factor solution, with seven items loading on each of task and relational crafting, and five items loading on cognitive crafting.

3.2 Confirmatory factor analysis (N = 180)

In order to examine if the three-factor solution fits the data best in the second sample, CFA was conducted using AMOS 19 (Arbuckle, 2010). As structural equation modelling requires a complete data set for each case (Byrne, 2010), it was determined a priori to drop any cases that were missing more than 5% of the items for the questionnaire. This approach led to three cases

being excluded from the analysis, leaving data from 180 participants. The remainder of the missing values for each item was very low (0.0% to 2.2%), and multiple imputation methods (three imputations with SPSS) were used to estimate these values (Little & Rubin, 2002).

CFA was performed initially on the 19-item scale, which indicated a reasonably poor fit to the data ($\chi^2/df = 2.44$, CFI = .89, NNFI = .88, IFI = .89, RMSEA = .09). Moreover, the RMSEA confidence interval was above the upper bound limit of .08 (Byrne, 2010). The modification indices suggested that two task-crafting items (items 6 and 7 from Table 1) correlated with the wrong factor. A relational-crafting item (item 17 from Table 1) correlated with the wrong factor, while another relational-crafting item (item 13 from Table 1) was both poorly correlated with the relational-crafting latent variable and the error term was correlated with several error terms for items that loaded on the cognitive and task-crafting latent variables. On this basis, these four items were dropped, which left 15 items for the analysis: five for each latent variable. Another CFA was conducted which indicated that the fit of the model was substantially improved. The fit indices indicated a model that fit the data well, and are presented in the top row of Table 2.

Table 2: Confirmatory factor analysis of the three-factor Job Crafting Questionnaire (N = 180)

Model	χ^2	df	χ^2/df	CFI	NNFI	IFI	RMSEA
Three factor model	149.01	87	1.71	.96	.95	.96	.06
One factor model	551.28	90	6.13	.68	.63	.68	.17

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. The final scale consists of 15 items: 5 for each job-crafting factor.

As can be observed in Table 2, the hypothesised three-factor model was tested against a single-factor model due to the possibility that job crafting is a uni-dimensional construct. For example, it is possible that the fact employees initiate changes to their work (uni-dimensional model) is more salient than the types of changes (hypothesised multi-dimensional model) employees initiate at work. Table 2 shows that the three-factor model fit the observed data better than the alternative one-factor model, supporting Hypothesis 1. The NNFI and IFI were both above .90, the CFI was greater than .95, and the normed chi square was less than 3. The RMSEA was also small (.06), with the confidence intervals within the range suggesting acceptable fit (lower bound = .05, upper bound = .08). All fit indices support a three-factor model. Moreover, all items loaded significantly and strongly on their respective latent variables, with standardised loadings ranging from .56 to .89 (all p 's < .001). Standardised parameter estimates indicated moderate to strong correlations between the latent variables: Task crafting-Relational crafting (.54), Relational crafting-Cognitive crafting (.74), and Task crafting-Cognitive crafting (.80).

3.3 Reliability analyses

Internal consistency statistics are presented in Table 3 (below). The Cronbach's alphas of the three sub-scales were all well above the recommended threshold of .70 (Nunnally & Bernstein, 1994). Before items were dropped, the scale reliabilities were .90, .89, .86, and .94 for task, cognitive, relational, and total job crafting, respectively. As can be observed in Table 3, after the items were dropped through the CFA process, these reliabilities were lowered slightly, though not substantially.

Table 3: Reliability estimates for task, cognitive, relational, and total job crafting

Scale	Number of items	Cronbach's alpha
Task Crafting	5	.87
Cognitive Crafting	5	.89
Relational Crafting	5	.83
Total Job Crafting	15	.91

Note: N = 334

3.4 Convergent validity

To examine the convergent validity of the new scale, the job crafting sub-scales and total scale were correlated with other variables with which they should be theoretically related. These correlations are presented in Table 4. Composite scores were calculated by adding the scores for each construct and dividing by the total number of items.

Table 4: Correlations between the dimensions of job crafting with job satisfaction, intrinsic goal strivings (work), strengths use, OCB, work contentment, work enthusiasm, work-related positive affect, and work related negative affect

Construct	1	2	3	4	5	6	7	8	9	10	11
1. Task Crafting											
2. Cognitive Crafting	.52**										
3. Relational Crafting	.42**	.53**									
4. Job Crafting Total	.81**	.83**	.77**								
5. Strengths Use	.43**	.39**	.36**	.49**							
6. Intrinsic Goal Setting (work)	.20**	.32**	.30**	.34**	.40**						
7. OCB	.40**	.33**	.41**	.47**	.35**	.22**					
8. Job Satisfaction	.38**	.45**	.21**	.43**	.41**	.30**	.24**				
9. Work Contentment	.29**	.26**	.13*	.28**	.24**	.25**	.14*	.62**			
10. Work Enthusiasm	.45**	.42**	.26**	.47**	.40**	.38**	.29*	.75**	.76**		
11. WSPA	.40**	.40**	.27**	.45**	.37**	.31**	.27**	.66**	.83**	.86**	
12. WSNA	-.25**	-.23**	-.11	-.26**	-.25**	-.30**	-.14*	-.67**	-.86**	-.84**	-.64**

Note: N = 250; OCB = Organisational Citizenship Behaviour; WSPA = Work-Specific Positive Affect; WSNA = Work-Specific Negative Affect.

* $p < .05$

** $p < .01$

It was predicted that all dimensions of the JCQ would exhibit positive correlations with similar behaviourally based indices of strengths use, intrinsic goal strivings at work, and OCB. As

expected, all of these correlations were significant and in the expected positive direction. It was also predicted that the dimensions of job crafting would be positively related with job satisfaction, work contentment, work enthusiasm, and WSPA. These correlations were also significant and positive. Finally, it was predicted that the dimensions of job crafting would be negatively correlated with WSNA. Although the relationship between relational crafting and WSNA did not reach statistical significance, it was in the expected negative direction. All other correlations were significant and negative, though the strength of these relationships was generally weaker than the relationships between job-crafting and proactive behaviours and positive states.

4. Discussion

The aim of the present study was to develop and validate the JCQ, which can be used in psychological research to assess the extent to which individuals engage in job-crafting activities. As hypothesised and consistent with Wrzesniewski and Dutton's (2001) model of job crafting, the present study showed the job-crafting items to load on the three dimensions of task crafting, relational crafting, and cognitive crafting. The EFA and CFA both revealed a three-factor structure that reflects each dimension of job crafting, though the CFA worked best when problematic items were dropped from the measure. Hence, all three forms of job crafting indicate different processes through which employees can take active roles in shaping their experience of work.

Also as hypothesised, the JCQ correlated in the hypothesised directions with other scales selected based on their theoretical association with job crafting. Thus, the JCQ dimensions exhibited positive correlations with other proactive-behaviour-based assessments such as strengths use, intrinsic goal setting at work, and OCB. The scale was also positively correlated with job satisfaction, work contentment, work enthusiasm, and WSPA, and negatively correlated with WSNA. All correlations support the measure's convergent validity. It is worth noting, however, that the JCQ exhibited weak, though generally significant, relationships with WSNA. It is possible, then, that job crafting holds a weaker influence on negative states than it does on positive states, probably because job-crafting activities are directed at enhancing the enjoyment and satisfaction employees attain from their work. Hence, it is plausible that job-crafting activities are used primarily by mentally healthy employees to enhance their work satisfaction and enjoyment rather than by dissatisfied or unhappy employees to lift themselves into states where their dissatisfaction, unhappiness, or other negative experiences are less intense. Job crafting, then, might be a useful strategy in enhancing the mental health and happiness of those people thought to be languishing (Keyes, 2002, 2003, 2007)—that is, people who neither suffer from mental illness nor experience positive mental health. It is these people who are often overlooked in psychological research (Keyes, 2003) and efforts to enhance their wellbeing will be a welcome addition to the literature. Further research is needed to confirm these findings using measures of other work-related negative states such as intention to leave, stress, exhaustion, or burnout.

The JCQ differed from existing measures of job crafting in three important ways. First, items were worded in a way that was relevant and meaningful for the general adult working population, rather than for specific working groups, occupations, or industries of interest. This allows the measure to be used in research involving a range of occupations, organisational contexts, or industries where scope exists for implementing job-crafting activities. Second, the JCQ showed that cognitive-crafting items loaded on a separate construct to the other more behavioural features of task and relational crafting. This suggests that cognitive crafting—the

processes through which employees frame their perception of their job in a more positive and meaningful light—forms a significant part of what constitutes job crafting. The JCQ hence aligns with the original three-component model of job crafting put forward by Wrzesniewski and Dutton (2001). This is important because, as argued by Wrzesniewski and Dutton, employee cognitions are an important component of what composes the experiences of a job. Employees can shape these cognitions, and in so doing, shape the way in which they approach and experience their work. Moreover, cognitions about work form an important part of our work identity (Wrzesniewski & Dutton, 2001) and crafting cognitions is a method by which employees can shape the way they define or perceive themselves at work. Through cognitive crafting, employees have the capacity to adopt a more positive and meaningful view of their work, which may ultimately have corresponding influences on employee wellbeing, turnover, or engagement. Although these relationships were not tested here, the JCQ opens these questions to empirical inquiry. Third, the JCQ is quite brief in terms of its number of items. Still, it retains equally notable factorial validity, convergent validity, and reliability statistics as previous measures. Researchers constrained for time may find it useful to assess job crafting using a more efficient measure, such as the JCQ, than those developed previously. The fact that the measure fits without allowing error terms to correlate also increases the probability that it will hold up across different working populations.

There are several implications of this study for the progression of job-crafting research. First, an alternative general scale can now be used to assess the extent to which employees craft their jobs. Due to its consistency with the original model of job crafting conceptualised by Wrzesniewski and Dutton (2001), it will allow researchers to assess the relationships between all three types of job crafting and different employee outcomes. Hence, the full range of antecedents and consequences of each dimension of job crafting can now be explored. Second, there is to our knowledge no present research that has explored whether the three forms of job crafting affect workplace outcomes, and similarly, there is no theory about the underlying mechanisms that explain how they might affect these outcomes. The JCQ will allow researchers to address these gaps by providing them with a statistically validated tool to progress job-crafting research, and ultimately, establish a sound theory as to how the dimensions of job crafting affect work outcomes. Finally, given the positive relationships between job crafting and the employee outcomes presented in Table 4, the JCQ may provide HR practitioners a useful tool to measure the extent to which their staff engage in job crafting and hence develop programs that enhance their employees' ability to engage in these activities that potentially impact proactive behaviour or wellbeing.

The current findings should be interpreted in light of some limitations. First, the sample was quite homogenous in terms of participants' education, nationality, and income, probably because most participants worked either in education (68%) or the corporate sector in Australia. The average years' education was 17.60, which is well above the length of time required to obtain a secondary education. Moreover, the average income was quite high, indeed higher than the average contemporary working income in most countries. This negates the generalisability of the findings to more diverse groups of workers, including, for example, the blue-collar sector and employees from diverse cultural groups. Another limitation is that the sample was not large enough to conduct an invariance test to determine whether the factor structure of the scale is sustainable across the wider adult working population. Invariance tests from different employee populations, such as blue-collar workers or employees working in different cultures would further elucidate how these employees craft their jobs to enhance the

experience of work. An invariance test will also allow researchers to further confirm the factor structure of the measure and cross-validate it in a separate sample beyond corporate Australia.

In conclusion, the JCQ fits a three-factor structure, supported by the results of both EFA and CFA. The total scale, as well as its individual dimensions, have demonstrated high internal consistency reliability. In addition, the measure correlates in theoretically expected directions with other similar, previously validated measures, thus supporting its convergent validity. Therefore, it is anticipated that the JCQ can be used to further progress job-crafting research. At the same time, further assessments should continue with diverse samples to provide cumulative and substantial psychometric evidence for this new measure. Ultimately, with the development of a theoretically based, practical, and psychometrically sound measure of job crafting, more information about the efficacy and applied utility of job-crafting interventions can be gained to improve the quality of employees' work life.

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Appendix: The Job Crafting Questionnaire (JCQ)

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 using the following scale: 1 = Hardly Ever, to 6 = Very Often. (Note: 'Very Often' means as often as possible in your workplace)

1. Introduce new approaches to improve your work*

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

2. Change the scope or types of tasks that you complete at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

3. Introduce new work tasks that you think better suit your skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

4. Choose to take on additional tasks at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

5. Give preference to work tasks that suit your skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

6. Think about how your job gives your life purpose

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

7. Remind yourself about the significance your work has for the success of the organisation

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

8. Remind yourself of the importance of your work for the broader community

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

9. Think about the ways in which your work positively impacts your life

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

10. Reflect on the role your job has for your overall well-being

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

11. Make an effort to get to know people well at work

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

12. Organise or attend work related social functions

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

13. Organise special events in the workplace (e.g., celebrating a co-worker's birthday)*

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

14. Choose to mentor new employees (officially or unofficially)

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

15. Make friends with people at work who have similar skills or interests

1 (Hardly Ever) 2 3 4 5 6 (Very Often)

Note: Items 1 to 5 reflect task crafting, items 5 to 10 reflect cognitive crafting, and items 11 to 15 reflect relational crafting.

*indicates items that were adapted or taken from Leana, Appelbaum, & Shevchuk (2009).