

Outcomes of Meaningful Work: A Meta-Analysis

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ABSTRACT Using job characteristics theory as a framework, we calculated meta-analytic effect sizes between meaningful work and various outcomes and tested a mediated model of meaningful work predicting proximal and distal outcomes with meta-analytic structural equation modelling (MASEM). From 44 articles ($N = 23,144$), we found that meaningful work had large correlations ($r = 0.70+$) with work engagement, commitment, and job satisfaction; moderate to large correlations ($r = 0.44$ to -0.49) with life satisfaction, life meaning, general health, and withdrawal intentions; and small to moderate correlations ($r = -0.19$ to 0.33) with organizational citizenship behaviours, self-rated job performance, and negative affect. The best MASEM fitting model was meaningful work predicting work engagement, commitment, and job satisfaction and these variables subsequently predicting self-rated performance, organizational citizenship behaviours, and withdrawal intentions. This meta-analysis provides estimated effect sizes between meaningful work and its outcomes and reveals how meaningful work relates directly and indirectly to key outcomes.

Keywords: job attitudes, job characteristics theory, job outcomes, meaningful work, wellbeing, work engagement

INTRODUCTION

Management scholars have long searched for factors that improve the performance, productivity, and wellbeing of workers. The Job Characteristics Theory (JCT; Hackman and Oldham, 1976) proposed meaningful work as a key psychological dimension that leads to higher job satisfaction, quality work performance, and lower turnover. However, since the publication of this theory, scholars have positioned other variables as outcomes of meaningful work, which the JCT has not incorporated. Moreover, meaningful work's

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relations to these outcomes have been heterogeneous across samples, which may be due to the diversity of meaningful work scales. In addition, meaningful work has demonstrated large correlations with work engagement, commitment, and job satisfaction, raising the possibilities that meaningful work either represents the same underlying construct or is a more proximal cause of these outcomes. Large correlations between work engagement, commitment, and job satisfaction and outcomes, such as performance, organizational citizenship behaviours (OCBs), and withdrawal intentions (Meyer et al., 2002), further suggest that meaningful work may have effects on more distal work-related outcomes through work engagement, commitment, and job satisfaction. Given these possibilities, the aims of this meta-analysis were to (a) estimate the meta-analytic effect sizes of the relations between meaningful work and its potential outcomes, (b) examine whether different types of meaningful work scales relate differentially to outcomes, and (c) test meaningful work's relation to work engagement, commitment, and job satisfaction in the prediction of work-related outcomes using MASEM.

Meaningful Work

Scholars have defined and operationalized meaningful work in various ways and sometimes used different terms interchangeably. A key distinction is between 'meaning' and 'meaningful work' (Pratt and Ashforth, 2003). 'Meaning' refers to what something signifies, so 'meanings' are closely related to meaning-making – a cognitive process whereby people construe, interpret, and understand their experiences (Wrzesniewski et al., 2003). Meanings, therefore, can have positive, negative, or neutral valence (Lepisto and Pratt, 2017). In contrast, 'meaningful work', 'meaningfulness', or 'meaning in work' refers to the significance or value of work, which by definition has positive valence (Lips-Wiersma et al., 2016).

Early conceptualizations of meaningful work were unidimensional and captured workers' perceptions that their work is worthwhile, important, or valuable (Hackman and Oldham, 1976; Pratt and Ashforth, 2003). While some scholars have maintained this conceptualization (e.g., May et al., 2004; Pratt and Ashforth, 2003; Spreitzer, 1995), others have developed broader, multidimensional conceptualizations that bring together aspects of the self – for example, self-actualization and personal growth – with aspects of being other-oriented – for example, helping others and contributing to the greater good (Lips-Wiersma and Wright, 2012; Rosso et al., 2010). These multidimensional models outline experiences that are meaningful; for example, expressing full potential and helping others are inherently meaningful experiences (Lepisto and Pratt, 2017; Martela and Pessi, 2018). Therefore, our perspective is that these are *processes* of meaningful experiences, rather than meaningful work itself.

To explain further, having meaningful work does not reflect a continuous psychological state (Bailey and Madden, 2017). Rather, people have many episodic experiences at work that are meaningful or meaningless, which they integrate into a belief system about the significance of their work. We contend that experiences are meaningful when people conduct actions that fulfil values that are relevant to their existence and explain why their work is worth doing (Allan et al., 2014; May et al., 2004). Therefore, meaningful experiences are individualized but not necessarily self-serving, and people must find a balance

between self-focused goals and other-oriented goals as well as between both being and doing (Lips-Wiersma and Wright, 2012). Furthermore, meaningful experiences likely involve emotional responses that mark certain actions as important, such as pride, inspiration, satisfaction, elevation, or self-transcendence (Carton, 2017; Haidt, 2003). Having meaningful work, in contrast to having meaningful experiences, involves retrospective, cognitive judgements that rely on memories of these events (Kahneman and Krueger, 2006). In other words, meaningful experiences contribute to an overall belief system about whether or not one's work has value. Therefore, similar to other scholars (e.g., Martela and Pessi, 2018; May et al., 2004; Pratt and Ashforth, 2003), we define *meaningful work* as the global judgement that one's work accomplishes significant, valuable, or worthwhile goals that are congruent work with one's existential values.

In summary, multidimensional models of meaningful work describe *processes* or *dimensions* of meaningful experiences, such as contributing to the greater good, which are likely to bring about meaningful experiences and contribute to an understanding of work as meaningful (Lips-Wiersma and Wright, 2012). In contrast, unidimensional models capture people's global judgement of whether their work is meaningful, perhaps summing some or all of the experiences reflected in multidimensional models. Because meaningful experiences are individualized, unidimensional models are on a higher order conceptually than multidimensional models because they do not specify the particular experiences that are meaningful (Martela and Pessi, 2018). Therefore, unidimensional models more closely align with our global definition of meaningful work.

Job Characteristics Theory

One of the first organizational theories to integrate meaningful work was the Job Characteristics Theory (JCT; Hackman and Oldham, 1976; Oldham and Hackman, 2010), which identifies conditions necessary for people to be intrinsically motivated and have high performance at work. The model proposes that five job dimensions (skill variety, task identity, task significance, autonomy, and feedback) lead to three critical psychological states (meaningful work, responsibility, and knowledge of results), which then result in beneficial outcomes (internal work motivation, quality work performance, job satisfaction, and low absenteeism). Within the JCT, workers experience positive affect when they perform well on a meaningful task. This positive affect is intrinsically motivating and creates a positive feedback loop of high quality performance, job satisfaction, and other beneficial work outcomes.

Reviews and meta-analyses of the JCT have supported many of its propositions (Fried and Ferris, 1987; Humphrey et al., 2007; Renn and Vandenberg, 1995) and have revealed meaningful work as a particularly important construct. For example, meaningful work relates more strongly and consistently to outcomes compared to other psychological states (Fried and Ferris, 1987; Johns et al., 1992; Humphrey et al., 2007) and is the strongest mediator of job characteristics and work outcomes (Humphrey et al., 2007; Johns et al., 1992). Given this research, meaningful work is a central variable in the JCT; however, the theory is limited in explaining (a) why meaningful work is such a critical variable, (b) the full range of beneficial outcomes to which it leads, and (c) whether meaningful work acts on certain outcomes via intermediate variables.

Kahn (1990) extended JCT in order to understand the conditions that lead people to engage in their work. He defined meaningful work as the sense that people's expression of their selves is worthwhile and valued and work engagement as the expression of workers' preferred selves. Therefore, Kahn argued that meaningful work and work engagement go beyond environmental job conditions to encompass deep aspects of oneself, including one's values and aspirations. Namely, when workers' job characteristics and tasks align with their own values and personal identities, they experience a high degree of meaningful work and are subsequently more likely to engage at work (Lips-Wiersma, 2002; Steger and Dik, 2010). This partially explains why meaningful work is such an important variable, but research suggests that meaningful work may closely link to variables beyond work engagement.

Proximal Outcomes of Meaningful Work

A more nuanced understanding of how meaningful work relates to outcomes requires examining if meaningful work has more proximal or direct relations with certain outcomes and more distal or indirect relations with others. In line with this possibility, some variables have much larger relations with meaningful work than others, including work engagement (0.45 to 0.84; Jacobs 2014; Williamson and Geldenhuys, 2014), job satisfaction (0.56 to 0.87; Duffy et al., 2014; Steger et al., 2012), and commitment (0.49 to 0.81; Duffy et al., 2014; Steger et al., 2012). This raises several possibilities. For example, meaningful work, work engagement, commitment, and job satisfaction may reflect the same underlying construct. This is consistent with some scholars considering work engagement and commitment (e.g., Britt et al., 2001) as components of meaningful work. Alternatively, work engagement, commitment, and job satisfaction may be proximal outcomes of meaningful work, meaning that they are immediate, consistent, and salient outcomes of experiencing work as meaningful. Conversely, work engagement, commitment, and job satisfaction may themselves lead to meaningful work. In this case, people may judge that their work is meaningful if it is engaging and satisfying and if they have a positive emotional attachment to their organization or career. We propose that meaningful work leading to work engagement, commitment, and job satisfaction is more consistent with theory and existing evidence, but scholars have not tested this claim, let alone in a meta-analytic framework.

To explain further, in Kahn's (1990) extension of the JCT, people are more likely to engage at work when they find it psychologically meaningful, which makes work engagement a closely related outcome of meaningful work. This is consistent with other scholars who have defined work engagement as an affective-motivational state where people are activated by and absorbed in their work (Czarnowsky, 2008; Maslach et al., 2001). From this perspective, meaningful work is a motivational force that propels people toward goal-directed behaviors and leads to positive affective states associated with work engagement (Chalofsky, 2003; Hackman and Oldham, 1976). Given this research, work engagement would have large correlation with meaningful work as one of its key proximal outcomes.

Likewise, job satisfaction – a global evaluation of how content workers are with their jobs (Allan et al., 2018) – may be another outcome that closely follows from meaningful

work. Disentangling meaningful work and job satisfaction is difficult because meaningful work is likely inherently satisfying. For example, Hackman and Oldham (1976) explain that performing work that is meaningful leads to positive affective states directly, which in turn leads to global evaluations of job satisfaction (Kahneman and Krueger, 2006). Regardless, there is some evidence that they are conceptually distinct. For example, nurses may find their work deeply meaningful because they save lives but also unsatisfying due to high levels of stress and burnout (Allan et al., 2018). Therefore, meaningful work may be inherently satisfying in most cases but still represents a unique construct.

Finally, meaningful work may also lead to a deep sense of commitment – an affective attachment people have to their organizations or careers (Blau, 1985). Although the JCT did not specifically mention commitment, several studies have linked meaningful work closely with commitment (Duffy et al., 2014; Steger et al., 2012). As noted above, meaningful work may build a sense of commitment by helping workers view their organizations as important vehicles for accomplishing goals consistent with their values (Kahn, 1990). In addition, the positive affect experienced by workers with meaningful work may strengthen their emotional attachments to their organizations and careers (Hackman and Oldham, 1976; Meyer et al., 2002). In summary, meaningful work may relate closely to work engagement, commitment, and job satisfaction not because they reflect the same underlying construct but because meaningful work reliably leads to these outcomes.

Distal Work-Related Outcomes of Meaningful Work

Scholars have positioned other work-related variables as outcomes of meaningful work, which have demonstrated smaller relations with meaningful work than work engagement, commitment, and job satisfaction. These include self-rated job performance (0.11–0.47; Allan et al., 2016c; Harris et al., 2007), organizational citizenship behaviours (0.20–0.42; Lam et al., 2016; Steger et al., 2012), and withdrawal intentions (–0.10 to –0.62; Arnoux-Nicolas et al., 2016a; Clausen and Borg, 2010). Again, this raises several possibilities. For example, meaningful work may relate indirectly to these outcomes via work engagement, commitment, and job satisfaction. Alternatively, meaningful work, work engagement, commitment, and job satisfaction may all represent the same underlying construct, which in turn predicts these outcomes, or work engagement, commitment, and job satisfaction may predict meaningful work, which in turn predicts these outcomes directly, though weakly.

Meaningful work relating to self-rated job performance, OCBs, and withdrawal intentions via work engagement, commitment, and job satisfaction is most consistent with existing literature. Specifically, according to Kahn (1990), work engagement involves people fully engaging their selves in work role performances, leading to a deep connection to and persistence in one's work. This may in turn lead to better performance, OCBs, and less withdrawal intentions, which is consistent with several empirical studies (Christian et al., 2011; Saks, 2006; Schaufeli and Bakker, 2004). Second, people who are satisfied with their work may have less withdrawal intentions, engage in more OCBs, and exhibit stronger performance due to their positive attitude towards their job (Harrison et al., 2006). Finally, commitment may lead to increased performance because committed workers are dedicated to their organizations and may be more creative and innovative

(Mathieu and Zajac, 1990; Meyer et al., 2002). Similarly, employees high in commitment may be less likely to have withdrawal intentions and more likely to engage in OCBs because they feel an obligation to their employer or due to their emotional attachment to their organization (Cetin et al., 2015; Meyer et al., 2002).

In summary, multiple frameworks and studies have placed work engagement, commitment, and job satisfaction as predictors of work-related outcomes. Overall, beliefs about the value of one's work (meaningful work) may lead to positive attitudinal change (work engagement, commitment, and job satisfaction), which may then lead to behavioral change (job performance, OCBs, and withdrawal intentions; Ajzen and Fishbein, 2000).

Distal Wellbeing Outcomes of Meaningful Work

Scholars have also proposed that meaningful work enhances wellbeing outside the workplace, including variables such as life satisfaction, negative affect, and general health (e.g., Allan et al., 2015; Steger et al., 2012). Life satisfaction refers to a global, cognitive judgement of a person's contentment with their current life (Diener et al., 1985), negative affect refers to a collection of aversive emotional states, including hostility, stress, anxiety, and depression (Allan et al., 2016a; Steger et al., 2012), and general health refers to one's overall physical functioning (Arnold and Walsh, 2015). In this case, meaningful work may relate directly to these outcomes but only as one of many factors in people's lives that predict wellbeing, making relations between meaningful work and general wellbeing relatively smaller. This is consistent with meaningful work's correlations to life satisfaction (0.33–0.49; Arnoux-Nicolas et al., 2016a, Shockley et al., 2016), negative affect (−0.04 to −0.32; Allan et al., 2016a; Steger et al., 2012), and general health (0.24–0.50; Arnold and Walsh, 2015, Soane et al., 2013), which have been small to large in effect size.

Finally, meaningful work may lead to greater perceptions of life meaning, which refers to the subjective experience that one's life is significant and worthwhile (Steger et al., 2012). Meaningful work may be a sub-domain of meaning in life (e.g., Ebersole and DePaola, 2001), which is supported by several studies that have asked participants the sources of their life meaning, finding common responses including relationships, religion, service, and work (e.g., Baum and Stewart, 1990; DeVogler and Ebersole, 1981; Emmons, 2005; Fegg et al., 2007). Therefore, meaningful work may translate into higher meaning in life, which is supporting by correlations between the constructs ($r = 0.18$ – 0.57 ; Allan et al., 2015; Arnoux-Nicolas et al., 2016a).

Meaningful Work Scale

As described above, scholars have both unidimensional and multidimensional conceptualizations of meaningful work. The measures based on the JCT's unidimensional definition of meaningful work capture the construct directly and let participants define the processes that cause their work to be meaningful. We refer to these scales as *significance* scales (Martela and Pessi, 2018). In contrast, *multidimensional* scales of meaningful work measure meaningful experiences (Lips-Wiersma and Wright, 2012; Martela and Pessi, 2018). For example, the Work as Meaning Inventory (WAMI; Steger et al., 2012) contains

subscales for positive meaning, meaning-making, and contributing the greater good. A concern with these multidimensional scales is that they may capture constructs that the JCT and other theories (e.g., Rosso et al., 2010) view as sources or even outcomes of meaningful work. For example, the WAMI captures contributions to the greater good, which overlaps with the job characteristic task significance – the perception that one's work has a positive impact on others (Grant, 2007). Although multidimensional conceptualizations are valuable in outlining meaningful experiences, they may have stronger relations to outcomes because they capture variance associated with constructs other than meaningful work. Therefore, examining the differential relations between types of meaningful work scales and outcomes is an important target for meta-analytic research.

The Present Study

The goals of the present study were to (a) estimate the meta-analytic effect sizes of the relations between meaningful work and its potential outcomes, (b) examine whether different types of meaningful work scales relate differentially to outcomes, and (c) test meaningful work's relation to work engagement, commitment, and job satisfaction in the prediction of work-related outcomes using MASEM. First, we systematically searched the meaningful work literature for variables that scholars have positioned as outcomes of meaningful work and evaluated the meta-analytic effect sizes of these relations. As noted above, we expected meaningful work to have large correlations with work engagement, job satisfaction, and commitment and small to moderate relations with performance, OCBs, withdrawal intentions, life satisfaction, negative affect, general health, and life meaning. Second, we tested whether significance meaningful work scales had different effect sizes with outcomes compared to multidimensional meaningful work scales. We predicted that, because they likely capture variance associated with other variables, multidimensional scales would have stronger relations to outcomes than significance scales.

Finally, we aimed to test MASEM models exploring meaningful work's relations to proximal and distal outcomes by constructing a meta-analytic correlation matrix from the current and past meta-analyses. As reviewed above, meaningful work may directly predict work engagement, job satisfaction, and commitment, which subsequently might predict self-rated performance, OCBs, and withdrawal intentions. Alternatively, work engagement, job satisfaction, and commitment may predict meaningful work, which in turn predicts self-rated performance, OCBs, and withdrawal intentions. Finally, meaningful work, work engagement, job satisfaction, and commitment may represent the same underlying construct. Given the theory and research reviewed above, we predicted that the model with meaningful work predicting self-rated performance, OCBs, and withdrawal intentions via work engagement, job satisfaction, and commitment would have the best fit.

METHOD

Literature Search

We conducted a search across multiple databases, including Humanities International Complete, Academic Search Premier, Military and Government Collection, Business

Abstracts with Full Text, Business Source Complete, CINAHL, Corporate ResourceNet, EconLit, Education Full Text, Educational Administration Abstracts, ERIC, Family & Society Studies Worldwide, Family Studies Abstracts, PsycARTICLES, PsycCRITIQUES, PsycINFO, Social Sciences, Women's Studies International, Health Business, Vocational and Career Collection, Entrepreneurial Studies Source, Humanities and Social Sciences Index Retrospective, Vocational Studies Premier, and MEDLINE. We used the search terms “work meaning” OR “meaningful work” OR “work meaningfulness” OR “meaningfulness of work” OR “job meaningfulness” OR “meaning of work” OR “meaningfulness at work” OR “meaning of working” OR “psychological meaningfulness” OR “experienced meaningfulness”. The search resulted in 292 unique articles, and we determined their relevance based on the article's title, keywords, and abstract. We found 268 relevant articles. Most excluded articles did not examine meaningful work as conceptualized in this paper.

Inclusion Criteria and Exclusion Criteria

We reviewed the 268 articles to make final inclusion and exclusion decisions. The first and third author, with expertise in meaningful work, decided on inclusion criterion. Based on the criterion, the second author coded all the articles. The third author coded a random sample of 20 per cent ($n = 62$) of the articles. The agreement between the two coders was 95.6 per cent. Based on the two studies that the coders did not agree upon, we clarified the coding process. To be included in the meta-analysis, articles needed to meet five criteria. The first criterion was that the article measured meaningful work. Scales could include any of the following: (a) WAMI (Steger et al., 2012), (b) Psychological Meaningfulness Scale (PMS) (Spreitzer, 1995), (c) Psychological Meaningfulness subscale (May et al., 2004), (d) Comprehensive Meaningful Work Scale (CMWS) (Lips-Wiersma and Wright, 2012), (e) Copenhagen Psychosocial Questionnaire (Kristensen et al., 2005; Pejtersen et al., 2010), (f) Engagement in Meaningful Work Scale (Treadgold, 1999), (g) Meaningful Work Scale (Höge and Schnell, 2012), (h) Meaningful Work Inventory (Fairlie, 2010), (i) Workplace Spirituality scale (Ashmos and Duchon, 2000), (j) Work Meaningfulness Scale (Bunderson and Thompson, 2009), and (k) any other create scales that were developed using one of the previous as a basis.

Second, articles needed to include a variable that scholars typically position as an outcome of meaningful work. In addition, in order to compute a meta-analytic effect, at least two other studies had to include an outcome within the same category. After an extensive review of the literature, this resulted in ten constructs: (1) commitment, (2) self-rated performance, (3) organizational citizenship behaviours, (4) withdrawal intentions, (5) work engagement, (6) job satisfaction, (7) life satisfaction, (8) general health, (9) negative affect, and (10) life meaning. Third, the study had to provide a correlation coefficient between meaningful work and at least one of the outcome or provide information that we could convert into a correlation coefficient. We contacted the authors of twelve articles that met inclusion criteria but did not provide a correlation coefficient, ten of whom responded with the necessary information. Fourth, the article could not violate the independent samples assumption, and fifth, studies had to be in English or have an English counterpart. We did not exclude studies based on location, year, or publication type.

Following the inclusion and exclusion decision-making process, we included 37 articles from the initial set of 268 articles. Of the excluded articles, the reasons were: (1) meaningful work measure was not as defined in this study ($n = 57$), (2) did not include an outcome ($n = 16$), (3) did not contain quantitative information to compute an effect size ($n = 158$), and (4) violated the independent samples assumption ($n = 0$). We also conducted an ancestral search using the 37 included articles as a basis and collected an additional 7 articles that met inclusion criteria. Figure 1 shows that 44 articles were included, and we recorded 76 correlation coefficients between meaningful work and the outcomes from 23,144 participants. The articles comprised both published journal articles ($k = 39$) and dissertations ($k = 5$).

Coding

The second and third authors, who had extensive training on the coding manual and the constructs in this study, coded the articles. To prevent errors, the coders reviewed all the data and had a 99.94 per cent agreement. When the coding differed, both coders reviewed the original article until they could agree on an appropriate value (Borenstein et al., 2009; Orwin and Vevea, 2009).

Statistical Analyses

We used the Hunter and Schmidt (2004) random-effects model for the meta-analysis. Using this model, we computed meta-analytic correlation coefficients, confidence intervals, and significance tests. As a common standard in meta-analyses, we corrected values to account for unreliability.

Meaningful work scale. We used the Comprehensive Meta-Analysis Software to examine whether or not the significance and multidimensional scales related differently to the

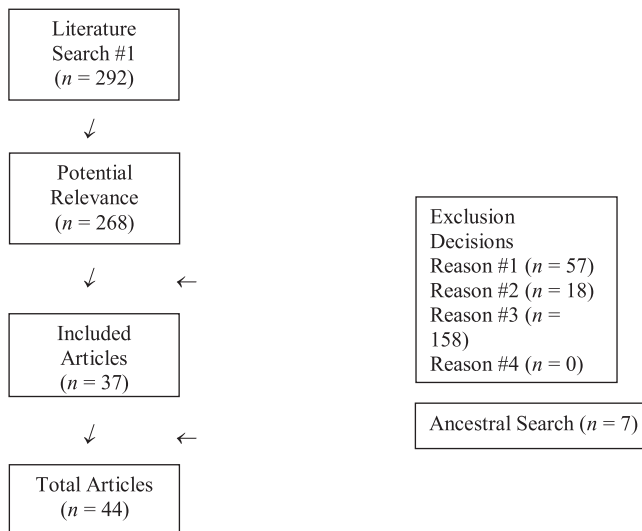


Figure 1. Literature search steps

outcome variables. We conducted the analyses on all effect size relations that had sufficient information (e.g., enough samples [≥ 3] with the relevant information). To determine if this analysis was necessary, we also conducted homogeneity analyses for the outcomes using a Q statistic and an I^2 statistic (Borenstein et al., 2009). The Q statistic represents total dispersion in effect sizes and reflects the need to test moderators when it is significant (Borenstein et al., 2009; Lipsey and Wilson, 2001). An I^2 statistic is the amount of observed variance that is due to true differences among the studies, rather than error, where a value of 25 per cent represents low levels, 50 per cent represents medium levels, and 75 per cent represents high levels (Higgins et al., 2003). Conducting this type of analyses is warranted when the Q value is significant and the I^2 value suggests that there are significant amounts of variance attributed to true differences between the samples.

To examine potential differences in effect sizes across meaningful work scales, we coded all the scales used as either (1) significance scales derived from the JCT's definition of meaningful work or (2) multidimensional scales. Examples of significance measures include the Psychological Meaningfulness Scale (Spreitzer, 1995), Psychological Meaningfulness subscale (May et al., 2004), and Work Meaningfulness Scale (Bunderson and Thompson, 2009). Examples of multidimensional scales include the Work as Meaning Inventory (Steger et al., 2012), Comprehensive Meaningful Work Scale (Lips-Wiersma and Wright, 2012), and Engagement in Meaningful Work Scale (Treadgold, 1999).

Publication bias analyses. To determine if missing articles in our analyses were a random subset of all the existing work or if there was a systematic difference among the missing studies (e.g., non-significant correlations), we conducted publication bias analyses for all meta-analytic effect sizes with 10 or more studies (Borenstein et al., 2009). This determines if the reported meta-analytic effect sizes show an upward bias or if publication bias is deflating the effect sizes. We assessed publication bias using funnel plots and trim and fill analyses (Borenstein et al., 2009).

Model testing. To conduct MASEM and test models, we created a meta-analytic correlational matrix based on the meta-analytic correlational values from previous meta-analyses as well as the present one (See Appendix B2). To fill the matrix, we systematically searched for meta-analyses of the outcome variables. Once the matrix was completed, we used it to conduct MASEM in Mplus Version 7 (Muthén and Muthén, 1998–2012). We used the harmonic mean of the meta-analytic sample sizes for analyses ($N = 4056.45$).

As noted above, we tested three competing models. Model A was the theoretically-derived model with meaningful work predicting work engagement, job satisfaction, and commitment, which in turn predicted performance, OCBs, and withdrawal intentions. By SEM convention, we allowed work engagement, job satisfaction, and commitment to covary and performance, OCBs, and withdrawal intentions to covary. This was the full mediation model with no direct paths from meaningful work to performance, OCBs, and withdrawal intentions. Model B tested an alternative model where work engagement,

job satisfaction, and commitment predicted meaningful work, which in turn predicted performance, OCBs, and withdrawal intentions. We allowed the same covariances as Model A. Similarly, this was the full mediation model with no direct paths from work engagement, job satisfaction, and commitment to performance, OCBs, and withdrawal intentions. Model C tested the proposition that meaningful work, work engagement, job satisfaction, and commitment represent the same underlying construct by loading the variables on a single factor and relating this factor to performance, OCBs, and withdrawal intentions. In this model, we allowed performance, OCBs, and withdrawal intentions to covary.

To evaluate models, we used fit indices that minimized the likelihood of Type I and Type II errors (Hu and Bentler, 1999). These included the chi-square test (χ^2), the comparative fit index (CFI), and the standardized root-mean-residual (SRMR). A significant χ^2 can indicate a poor fitting model but is unreliable in large samples. Criteria for the CFI and SRMR have ranged from less conservative (CFI \geq 0.90; SRMR \leq 0.10) to more conservative (CFI \geq 0.95; SRMR \leq 0.06; Hu and Bentler, 1999). We evaluated the difference between nested models with the chi-square difference test (Muthén and Muthén, 1998–2012).

Results

Effect Sizes

Meaningful work had significant positive relations with (1) organizational commitment, (2) self-rated job performance, (3) organizational citizenship behaviours, (4) work engagement, (5) job satisfaction, (6) life satisfaction, (7) general health, and (8) life meaning and significant negative relations with (1) negative affect and (2) withdrawal intentions. Table I displays the corrected meta-analytic correlation coefficients and other statistics (see Appendix A1 for all included studies).

Moderation Analyses

Based on the Q and I^2 statistics (see Table I), testing how the meaningful work scale differentially related to outcomes was warranted when the necessary information was available. Our results indicated that the type of meaningful work scale did not differently relate to job satisfaction, work engagement, withdrawal intentions, or commitment (see Table II).

Publication Bias

We assessed publication bias for all effect sizes of outcomes based on ten or more studies (Borenstein et al., 2009). First, we examined funnel plots to determine if smaller versus larger studies were distributed asymmetrically along the horizontal axis, which represents the effect size. Next, we used the trim-and-fill method to determine the impact of the potential publication bias. Evidence for publication bias is based on the degree to which the imputed meta-analytic effect size differs from the observed meta-analytic

Table I. Meta-analytic effect sizes

<i>Outcome</i>	<i>k</i>	<i>N</i>	<i>r^{adj}</i>	<i>p-value</i>	<i>95% CI</i>	<i>Q</i>	<i>I²</i>
Engagement	18	6391	0.74*	0.00	0.69, 0.78	275.93	93.84
Commitment	11	10,537	0.75*	0.00	0.69, 0.80	283.10	96.47
Withdrawal	10	11,108	-0.49*	0.00	-0.65, -0.30	1059.74	99.15
OCBs	3	1927	0.33*	0.00	0.20, 0.46	15.362	86.98
Performance	5	1743	0.33*	0.00	0.23, 0.42	18.50	78.38
Job satisfaction	11	3962	0.74*	0.00	0.61, 0.83	571.57	98.25
Life satisfaction	5	2275	0.47*	0.00	0.42, 0.53	10.68	62.54
Life meaning	6	2966	0.53*	0.00	0.39, 0.65	127.54	96.08
General health	3	986	0.44*	0.00	0.24, 0.61	20.58	90.28
Negative affect	4	1085	-0.19*	0.02	-0.34, -0.03	20.63	85.46

Notes: *k* = number of samples; *N* = sample size; *r^{adj}* = meta-analytic effect size corrected for unreliability; 95% CI = 95% confidence interval; *Q* = chi-square test of heterogeneity; *I²* = percent variance explained by true differences; *p-value* = significance test; * = significant at the .01 level; OCBs = Organizational citizenship behaviours; Performance = Self-rated job performance.

effect size. We were able to evaluate publication bias for the following effect sizes (see Appendix C3): meaningful work and commitment, withdrawal, work engagement, and job satisfaction. Overall, we found that the effect sizes for these relations were not significantly impacted by publication bias (for full results see Table III). Although there was some indication of publication bias for job satisfaction, this was not significant based on the overlapping confidence intervals between the observed and adjusted values.

Model Testing

Model A, the theoretically derived model, had good fit to the data, $\chi^2(3) = 84.39$, $p < 0.001$, CFI = 0.99, and SRMR = 0.01. Within this model, meaningful work strongly predicted work engagement ($\beta = 0.74$), job satisfaction ($\beta = 0.74$), and commitment ($\beta = 0.75$). In contrast, Model B had poor fit to the data, $\chi^2(9) = 1588.66$, $p < 0.001$, CFI = 0.83, and SRMR = 0.07, which was significantly worse than Model A, $\Delta\chi^2(6) = 1504.27$, $p < 0.001$. In addition, work engagement ($\beta = 0.32$), job satisfaction ($\beta = 0.29$), and commitment ($\beta = 0.41$) did not predict meaningful work as strongly as meaningful work predicted these variables. Model C, which loaded meaningful work, work engagement, job satisfaction, and commitment onto a single factor, also had poor fit to the data, $\chi^2(11) = 1619.02$, $p < 0.001$, CFI = 0.88, and SRMR = 0.06, and was significantly worse than Model A, $\Delta\chi^2(8) = 1534.63$, $p < 0.001$. Therefore, we retained Model A as the best fitting model. Table IV depicts the final paths from this model, which explained 54 per cent of the variance in work engagement, 55 per cent in job satisfaction, 56 per cent in commitment, 24 per cent in performance, 14 per cent in OCBs, and 35 per cent in withdrawal intentions.

Indirect effects. The indirect effects from meaningful work to performance were significant via work engagement (95% CI [0.34, 0.39]), job satisfaction (95% CI [0.07, 0.12]), and

Table II. MW scale (significance scale v. multidimensional scale) comparison results

		<i>K</i>	<i>N</i>	r^{adj}	95% <i>CI</i>	<i>Q</i>	<i>p-value</i>
JS	Significance	3	758	0.65	0.56, 0.73		0.00
	Multidimensional	8	3204	0.77	0.61, 0.86		0.00
	Total between					1.87	0.17
Engage	Significance	13	4526	0.72	0.66, 0.78		0.00
	Multidimensional	5	1865	0.77	0.72, 0.81		0.00
	Total between					1.11	0.29
Commit	Significance	4	7226	0.70	0.65, 0.75		0.00
	Multidimensional	7	3311	0.78	0.68, 0.84		0.00
	Total between					2.25	0.13
Withdra	Significance	6	8275	-0.47	-0.68, -0.17		0.00
	Multidimensional	4	2833	-0.54	-0.78, -0.16		0.01
	Total Between					0.11	0.75

Notes: *k* = number of samples; *N* = sample size; r^{adj} = meta-analytic effect size corrected for unreliability; 95% *CI* = 95% confidence interval; *Q* = chi-square test of heterogeneity; *I* = percent variance explained by true differences; *p-value* = significance test; * = significant at the .05 level; Total between = Whether the two scales significantly differ from one another in terms of size of effect; * = scales significantly differ at the $p < 0.01$; JS = Job Satisfaction; Engage = Engagement; Commit = Commitment, Withdra = Withdrawal.

Table III. Trim and fill analyses

<i>Outcome</i>		r^{adj}	95% <i>CI</i>
Engagement	Observed value	0.74	0.69, 0.78
	Adjusted value	0.74	0.69, 0.78
Commitment	Observed value	0.75	0.69, 0.80
	Adjusted value	0.75	0.69, 0.80
Withdrawal	Observed value	-0.49	-0.65, -0.30
	Adjusted value	-0.49	-0.65, -0.30
Job satisfaction*	Observed value	0.74	0.61, 0.83
	Adjusted value	0.79	0.70, 0.85

Notes: r^{adj} = meta-analytic effect size corrected for unreliability; 95% *CI* = confidence intervals; observed value = meta-analytic effect size not corrected for publication bias; adjusted value = meta-analytic effect size corrected for any detected publication bias; * = indicates some missing studies due to publication bias that deflates the size of the effect

commitment (95% *CI* [-0.24, -0.18]). The indirect effects from meaningful work to OCBs were significant via work engagement (95% *CI* [0.11, 0.17]), job satisfaction (95% *CI* [0.01, 0.07]) and commitment (95% *CI* [0.11, 0.17]). Finally, the indirect effects from meaningful work to withdrawal intentions were significant via work engagement (95% *CI* [0.5, 0.10]), job satisfaction (95% *CI* [-0.46, -0.41]), and commitment (95% *CI* [-0.10, -0.05]).

Table IV. Regression paths from final structural model

<i>Predictor</i>	<i>Criterion</i>	β	<i>SE</i>	<i>p</i>
Meaningful work	Job satisfaction	0.74	0.012	<0.001
	Work engagement	0.74	0.011	<0.001
	Commitment	0.75	0.010	<0.001
Work engagement	OCBs	0.19	0.017	<0.001
	Performance	0.50	0.019	<0.001
	Withdrawal intentions	0.10	0.019	<0.001
Job satisfaction	OCBs	0.06	0.020	0.008
	Performance	0.13	0.020	<0.001
	Withdrawal intentions	-0.59	0.018	<0.001
Commitment	OCBs	0.18	0.017	<0.001
	Performance	-0.28	0.018	<0.001
	Withdrawal intentions	-0.10	0.019	<0.001

DISCUSSION

The purpose of this meta-analysis was to (a) estimate the meta-analytic effect sizes of the relations between meaningful work and its potential outcomes, (b) examine whether different types of meaningful work scales relate differentially to outcomes, and (c) test meaningful work's relation to work engagement, commitment, and job satisfaction in the prediction of work-related outcomes. The meta-analytic effect sizes between meaningful work and the outcomes were mostly moderate to large, and different types of meaningful work scales did not relate differentially to outcomes. A model positioning meaningful work as a predictor of work engagement, commitment, and job satisfaction, which in turn predicted self-rated job performance, OCBs, and withdrawal intentions best explained the data, and these indirect effects were significant.

As predicted, meaningful work had large meta-analytic correlations with work engagement, job satisfaction, and commitment, moderate to large meta-analytic relations with withdrawal intentions, and small to moderate meta-analytic relations with organizational citizenship behaviours and self-rated job performance. In order to examine the potential redundancy of meaningful work, work engagement, job satisfaction, and commitment, we tested several models. As explained previously, meaningful work and these variables may tap into the same underlying experience or construct. For example, the high correlation may reflect an attitudinal bias: people predisposed to positive attitudes may be more likely to experience meaningful work, work engagement, and so on. However, theory (e.g., Steger and Dik, 2010), empirical studies (e.g., Allan et al., 2018), and moderate relations between meaningful work and personality variables (Britt et al., 2001) provide evidence that these constructs are different. Moreover, the current meta-analysis revealed that meaningful work, work engagement, job satisfaction, and commitment as indicators of the same construct had poor fit to the data. This suggests that these constructs are different and that the meaningful work construct adds value to the literature.

Rather than construct redundancy, we found that the best fitting model was meaningful work predicting work engagement, job satisfaction, and commitment, which subsequently predicted performance, OCBs, and withdrawal intentions, and indirect effects were significant from meaningful work to the distal outcomes via the proximal outcomes. This was in contrast to a model with meaningful work as the mediator, which fit poorly to the data. Building on the JCT, meaningful work may lead to attitude change first because it reflects a belief system about one's work – that one's work is valuable and worthwhile – which may subsequently lead to a wide range of positive attitudinal and affective states, including work engagement, job satisfaction, and commitment (Ajzen and Fishbein, 2000). These positive attitudinal states may then initiate behavioural changes, such as OCBs, which corroborates past meta-analytic research showing that higher-order job attitudinal constructs (e.g., job satisfaction, commitment) predict behavioral criteria (e.g., performance, withdrawal; Ajzen and Fishbein, 2000; Harrison et al., 2006). However, we also found that the attitudinal states related to the behavioural criteria in different ways. For example, work engagement was the strongest predictor of performance, job satisfaction was the strongest predictor of withdrawal intentions, and both work engagement and commitment predicted OCBs. In summary, meaningful work may be an important facilitator of positive attitudes and affective states, which lead differentially to behavioural changes.

Finally, meaningful work had moderate to large relations with life satisfaction, life meaning, and general health and a small to moderate relation with negative affect. These variables reflect wellbeing variables that do not directly refer to one's work. There is a large body of research indicating that positive emotional states and satisfaction at work spill-over to other domains (Rodríguez-Muñoz et al., 2014). People return from work happy, which improves relationships and overall functioning, making people healthier and more satisfied with their lives (Cho and Tay, 2016). The meaningfulness derived from work may also translate into a more meaningful life (e.g., Ebersole and DePaola, 2001). For negative affect, meaningful work may be better at promoting wellbeing than reducing negative emotions. Positive and negative affect are largely independent (Watson et al., 1988), and meaningful work may not have direct effects on negative affect alone (Allan et al., 2018). However, many variables unrelated to work affect wellbeing, so meaningful work understandably has smaller relations to these variables than domain-specific variables, like job satisfaction. Regardless, these meta-analytic relations suggest that meaningful work has important implications for wellbeing.

Type of meaningful work scale did not relate differently to work engagement, job satisfaction, commitment, and withdrawal intentions, although there were clear trends toward multidimensional scales having stronger relations to these outcomes. The multidimensional scales may have had significantly larger relations to these outcomes with more studies. Again, multidimensional scales capture meaningful experiences that likely to lead to judgements of meaningful work and may capture constructs that overlap with job characteristics or other sources of meaningful work (e.g., task significance, Steger et al., 2012). Meta-analyses show that job characteristics have direct effects on outcomes, including variables like job satisfaction (Humphrey et al., 2007), which has implications for how scholars measure meaningful work. Specifically, understanding the antecedents

of meaningful work and how it relates to outcomes may require using a scale derived from the JCT specifically (e.g., May et al., 2004; Spreitzer, 1995), rather than multidimensional scales, which may be better suited for understanding the experiences or processes that give rise to meaningful work (Lips-Wiersma and Wright, 2010).

Results of this meta-analysis broadly support the notion that people with meaningful work *feel* better and *work* better but also extend the JCT by supporting a more complex outcome structure related to meaningful work and by providing evidence that meaningful work is conceptually distinct from closely related constructs. These results highlight meaningful work's role in promoting beneficial outcomes and can guide theoretical development in this area. Specifically, scholars of meaningful work have typically focused on the sources or processes of meaningful work (e.g., Lips-Wiersma and Wright, 2012; Rosso et al., 2010) and only recently begun to examine meaningful work's relation to outcomes (e.g., Barrick et al., 2013). However, like the JCT, outcome-based theories often place attitudinal and behavioural variables as equal consequences of meaningful work. Building on previous work (Barrick et al., 2013), the current meta-analysis suggests that meaningful work leads to motivational or attitudinal change first, which only then influences behavioural change. Going forward, more complete theories of meaningful work and its outcomes should include motivational, attitudinal, behavioural, and wellbeing outcomes and explain how these interrelate in complex psychological systems.

Future Directions

The primary future direction this meta-analysis suggests is integrating a more complete understanding of JCT's relations to outcomes, namely, meaningful work leading to change in attitudes, which then may affect behaviours. Testing the JCT with this outcome structure is an important direction for future research, and integrating this more nuanced perspective may be critical given the changing nature of work, including organizations' increased reliance on decentralized structures with fewer permanent employees and more contract workers (Hall and Moss, 1998). Without stable job characteristics, people's sense of meaningful work may be the thread that runs between temporary positions. As workers market their 'selves', their skills, knowledge, and abilities, understanding the significance of their work may be more central to positive attitudes and behaviours at work.

Scholars have also updated the JCT to modern workplaces by incorporating variables like information processing, specialization, personality, and dependence on electronics (e.g., Barrick et al., 2013; Gibson et al., 2011). However, to maximize worker outcomes like work engagement, job satisfaction, and commitment, researchers might pay particular attention to conditions that facilitate meaningful work. As noted by Oldham and Hackman (2010) themselves, workers are not passive recipients of job characteristics but actively change the nature of their work. A growing literature indicates this job crafting may increase meaningful work, especially in modern workplaces (Hall and Moss, 1998; Wrzesniewski and Dutton, 2001). In addition, the social context of work may be an important factor for enhancing meaningful work that was absent from the original specification of the JCT (Oldham and Hackman, 2010; Wrzesniewski et al., 2003). As noted by Wrzesniewski and colleagues (2003), meaning-making is a highly social and contextualized process. It involves workers' interpretations of both subtle and explicit cues about

the value of their jobs, work roles, and selves (Kahn, 1990). These interpretations can translate into experienced meaningful work or alienation, depending on the message workers receive (Wrzesniewski et al., 2003). Therefore, incorporating job crafting and social contextual variables is an important extension of the JCT.

Finally, there may be variables that moderate meaningful work and its outcomes. In addition to being another job characteristic, aspects of the social context may be critical for translating meaningful work into positive outcomes, like work engagement (Barrick et al., 2013; Oldham and Hackman, 2010). For example, having positive workplace relationships and contact with the beneficiaries of one's work may be particularly salient moderators (Grant, 2007). Individual difference factors, like personal values or personality, may also be important moderators (Chalofsky, 2003). Therefore, future theory and research should focus on identifying moderators, given the variability revealed in this meta-analysis.

Limitations

Interpretations of the current meta-analysis should take into account several limitations. First, meta-analytic correlation coefficients do not provide cause and effect, and only experimental studies can determine whether meaningful work causes these outcomes. Second, some scholars have argued that meta-analysis compares dissimilar samples or samples of differing quality, making the results questionable (Sharpe, 1997). However, one way to address this weakness is to have sub-group effect sizes within an overall subject area, which we did in the present meta-analysis (Lipsey and Wilson, 2001). Specifically, rather than looking at the overall impact of meaningful work on outcomes, we examined the relation between meaningful work and specific types of outcomes grouped based on similarity. Additionally, we only included meaningful work measures that defined the construct in a similar way.

Third, another limitation of meta-analyses is the 'file drawer problem'. Scholars report and publish studies with significant findings more often than studies with non-significant findings (Hedges and Vevea, 1996; Rosenthal, 1979). While this is a weakness difficult to avoid, we attempted to alleviate it by not restricting our search to formally published studies (e.g., including dissertations). We also conducted analyses to ensure we had a representative sample of all relevant published and unpublished work to determine with greater certainty that there were not an influential number of missing studies with smaller correlation coefficients. Results from the trim-and-fill method suggest that the meta-analytic effect sizes were not inflated due to publication bias. Despite this evidence, the included studies may not be representative of all studies. Fourth, several of the outcomes (OCBs, general health, and negative affect) had fewer than five studies available to calculate effect sizes. Therefore, more studies are needed before their meta-analytic effect sizes can be interpreted with greater confidence.

Fifth, although the studies in this meta-analysis represented a broad range of organizations, jobs, and industries, the vast majority were from the United States, and all were in a Western context. Aspects of meaningful work, like the expression of the self and experiencing personal meaningfulness, exist within individualistic cultural frameworks, and there is reason to suspect that the experience of meaningful work differs across

cultures. For example, one study from Korea indicated that, in addition to some shared components, collectivist cultures might integrate components like recognition and family support (Tak et al., 2017). Therefore, the results of this study are only generalizable to a Western context.

Finally, the focus of this meta-analysis was on the outcome side of the JCT. Testing the job characteristics side was beyond the scope of this meta-analysis, but this precluded a complete test of the JCT model. Although previous meta-analyses have accomplished this goal (Fried and Ferris, 1987; Humphrey et al., 2007), future studies can integrate both proximal and distal outcomes of meaningful work when testing JCT models.

REFERENCES

- Ajzen, I. and Fishbein, M. (2000). 'Attitudes and the attitude-behavior relation: reasoned and automatic processes'. *European Review of Social Psychology*, **11**, 1–33.
- Allan, B. A., Autin, K. L. and Duffy, R. D. (2014). 'Examining social class and work meaning within the psychology of working framework'. *Journal of Career Assessment*, **22**, 543–61.
- Allan, B. A., Autin, K. L. and Duffy, R. D. (2016a). 'Self-determination and meaningful work: exploring socioeconomic constraints'. *Frontiers in Psychology*, **7**, 1–9.
- Allan, B. A., Dexter, C., Kinsey, R. and Parker, S. (2018). 'Meaningful work and mental health: job satisfaction as a moderator'. *Journal of Mental Health*, **27**, 38–44.
- Allan, B. A., Douglass, R. P., Duffy, R. D. and McCarty, R. J. (2016b). 'Meaningful work as a moderator of the relation between work stress and meaning in life'. *Journal of Career Assessment*, **24**, 429–40.
- Allan, B. A., Duffy, R. D. and Collisson, B. (2016c). 'Task significance and performance meaningfulness as a mediator'. *Journal of Career Assessment*, **26**, 172–82.
- Allan, B. A., Duffy, R. D. and Douglass, R. (2015). 'Meaning in life and work: a developmental perspective'. *The Journal of Positive Psychology*, **10**, 323–31.
- Arnold, K. A. and Walsh, M. M. (2015). 'Customer incivility and employee well-being: testing the moderating effects of meaning, perspective taking and transformational leadership'. *Work and Stress*, **29**, 362–78.
- Arnold, K. A., Turner, N., Barling, J., Kelloway, E. K. and McKee, M. C. (2007). 'Transformational leadership and psychological well-being: the mediating role of meaningful work'. *Journal of Occupational Health Psychology*, **12**, 193–203.
- Arnoux-Nicolas, C., Sovet, L., Lhotellier, L. and Bernaud, J.-L. (2016a). 'Development and validation of the meaning of work inventory among French workers'. *International Journal for Educational and Vocational Guidance*, **17**, 165–85.
- Arnoux-Nicolas, C., Sovet, L., Lhotellier, L., Di Fabio, A. and Bernaud, J.-L. (2016b). 'Perceived work conditions and turnover intentions: the mediating role of meaning of work'. *Frontiers in Psychology*, **7**, 1–9.
- Ashmos, D. P. and Duchon, D. (2000). 'Spirituality at work: a conceptualization and measure'. *Journal of Management Inquiry*, **9**, 134–45.
- Bailey, C. and Madden, A. (2017). 'Time reclaimed: temporality and the experience of meaningful work'. *Work, Employment and Society*, **31**, 3–18.
- Barrick, M. R., Mount, M. K. and Li, N. (2013). 'The theory of purposeful work behavior: the role of personality, higher-order goals, and job characteristics'. *Academy of Management Review*, **38**, 132–53.
- Baum, S. K. and Stewart, R. B. (1990). 'Sources of meaning through the lifespan'. *Psychological Reports*, **67**, 3–14.
- Blau, G. J. (1985). 'The measurement and prediction of career commitment'. *Journal of Occupational and Organizational Psychology*, **58**, 277–88.
- Borenstein, M., Hedges, L. V., Higgins, J. P. T. and Rothstein, H. R. (2009). *Introduction to Meta-Analysis*. Chichester: Wiley.
- Britt, T. W., Adler, A. B. and Bartone, P. T. (2001). 'Deriving benefits from stressful events: the role of engagement in meaningful work and hardiness'. *Journal of Occupational Health Psychology*, **6**, 53–63.
- Bunderson, J. S. and Thompson, J. A. (2009). 'The call of the wild: Zookeepers, callings, and the double-edged sword of deeply meaningful work'. *Administrative Science Quarterly*, **54**, 32–57.

- Carton, A. M. (2017). ‘“I’m not mopping the floors, I’m putting a man on the moon”: How NASA leaders enhanced the meaningfulness of work by changing the meaning of work’. *Administrative Science Quarterly*, **63**, 323–69.
- Cetin, S., Gürbüz, S. and Sert, M. (2015). ‘A meta-analysis of the relationship between organizational commitment and organizational citizenship behavior: test of potential moderator variables’. *Employee Responsibilities and Rights Journal*, **27**, 281–303.
- Chalofsky, N. (2003). ‘An emerging construct for meaningful work’. *Human Resource Development International*, **6**, 69–83.
- Chen, Z., Zhang, X. and Vogel, D. (2011). ‘Exploring the underlying processes between conflict and knowledge sharing: a work-engagement perspective’. *Journal of Applied Social Psychology*, **41**, 1005–33.
- Chikoko, G. L., Buitendach, J. H. and Kanengoni, H. (2014). ‘The psychological conditions that predict work engagement among tertiary education employees’. *Journal of Psychology in Africa*, **24**, 469–74.
- Cho, E. and Tay, L. (2016). ‘Domain satisfaction as a mediator of the relationship between work-family spillover and subjective well-being: a longitudinal study’. *Journal of Business and Psychology*, **31**, 445–57.
- Christian, M. S., Garza, A. S. and Slaughter, J. E. (2011). ‘Work engagement: a quantitative review and test of its relations with task and contextual performance’. *Personnel Psychology*, **64**, 89–136.
- Clausen, T. and Borg, V. (2010). ‘Do positive work-related states mediate the association between psychosocial work characteristics and turnover? A longitudinal analysis’. *International Journal of Stress Management*, **17**, 308–24.
- Czarnowsky, M. (2008). *Learning’s Role in Employee Engagement: An ASTD Research Study*. Alexandria: American Society for Training and Development.
- Demirtas, O., Hannah, S. T., Gok, K., Arslan, A. and Capar, N. (2015). ‘The moderated influence of ethical leadership, via meaningful work, on followers’ engagement, organizational identification, and envy’. *Journal of Business Ethics*, **145**, 1–17.
- DeVaro, J., Li, R. and Brookshire, D. (2007). ‘Analysing the job characteristics theory: new support from a cross-section of establishments’. *The International Journal of Human Resource Management*, **18**, 986–1003.
- DeVogler, K. L. and Ebersole, P. (1981). ‘Adults’ meaning in life’. *Psychological Reports*, **49**, 87–90.
- Diener, E. D., Emmons, R. A., Larsen, R. J. and Griffin, S. (1985). ‘The satisfaction with life scale’. *Journal of Personality Assessment*, **49**, 71–75.
- Duffy, R. D., Allan, B. A., Autin, K. L. and Bott, E. M. (2013). ‘Calling and life satisfaction: it’s not about having it, it’s about living it’. *Journal of Counseling Psychology*, **60**, 42–52.
- Duffy, R. D., Allan, B. A., Autin, K. L. and Douglass, R. P. (2014). ‘Living a calling and work well-being: a longitudinal study’. *Journal of Counseling Psychology*, **61**, 605–15.
- Duffy, R. D., Autin, K. L. and Bott, E. M. (2015). ‘Work volition and job satisfaction: examining the role of work meaning and person–environment fit’. *The Career Development Quarterly*, **63**, 126–40.
- Duffy, R. D., Autin, K. L. and Douglass, R. P. (2016). ‘Examining how aspects of vocational privilege relate to living a calling’. *The Journal of Positive Psychology*, **11**, 416–27.
- Duffy, R. D., Bott, E. M., Allan, B. A., Torrey, C. L. and Dik, B. J. (2012). ‘Perceiving a calling, living a calling, and job satisfaction: testing a moderated, multiple mediator model’. *Journal of Counseling Psychology*, **59**, 50–59.
- Dwyer, P. C., Bono, J. E., Snyder, M., Nov, O. and Berson, Y. (2013). ‘Sources of volunteer motivation: transformational leadership and personal motives influence volunteer outcomes’. *Nonprofit Management and Leadership*, **24**, 181–205.
- Ebersole, P. and DePaola, S. (2001). ‘Meaning in life categories of later life couples’. *Journal of Psychology: Interdisciplinary and Applied*, **121**, 185–91.
- Emmons, R. A. (2005). ‘Striving for the sacred: personal goals, life meaning, and religion’. *Journal of Social Issues*, **61**, 731–45.
- Fairlie, P. (2010). ‘The meaningful work inventory: development and initial validation.’ In *Proceedings of 118th Annual Convention of the American Psychological Association*, San Diego, CA, 12–15 August.
- Fairlie, P. (2011). ‘Meaningful work, employee engagement, and other key employee outcomes: implications for human resource development’. *Advances in Developing Human Resources*, **13**, 508–25.
- Fegg, M. J., Kramer, M., Bausewein, C. and Borasio, G. D. (2007). ‘Meaning in life in the Federal Republic of Germany: Results of a representative survey with the schedule for meaning in life evaluation (SMiLE)’. *Health and Quality of Life Outcomes*, **5**, 59–67.
- Fried, Y. and Ferris, G. R. (1987). ‘The validity of the job characteristics model: A review and meta-analysis’. *Personnel Psychology*, **40**, 287–322.

- Goldenhuis, M., Laba, K. and Venter, C. M. (2014). 'Meaningful work, work engagement and organisational commitment'. *SA Journal of Industrial Psychology*, **40**, 1–10.
- George, S. (2015). *Perceptions of top management team commitment to corporate social responsibility: An exploration of the relationship with employee engagement*. Unpublished PhD Dissertation, St. Ambrose University, IA.
- Ghadi, M. Y., Fernando, M. and Caputi, P. (2013). 'Transformational leadership and work engagement: The mediating effect of meaning in work'. *Leadership and Organization Development Journal*, **34**, 532–50.
- Gibson, C. B., Gibbs, J. L., Stanko, T. L., Tesluk, P. and Cohen, S. G. (2011). 'Including the "I" in virtuality and modern job design: extending the job characteristics theory to include the moderating effect of individual experiences of electronic dependence and copresence'. *Organization Science*, **22**, 1481–99.
- Grant, A. M. (2007). 'Relational job design and the motivation to make a prosocial difference'. *Academy of Management Review*, **32**, 393–417.
- Hackman, J. R. and Oldham, G. R. (1976). 'Motivation through the design of work: test of a theory'. *Organizational Behavior and Human Performance*, **16**, 250–79.
- Haidt, J. (2003). 'The moral emotions'. In Davidson, R. J., Scherer, K. R. and Goldsmith, H. H. (Eds), *Series in Affective Science. Handbook of Affective Sciences*. New York: Oxford University Press, 852–70.
- Hall, D. T. and Moss, J. E. (1998). 'The new protean career contract: helping organizations and employees adapt'. *Organizational Dynamics*, **26**, 22–37.
- Hammons, L. R. (2014). *Relationships among Non-Academic Employee Perceptions of Manager Leadership Behaviors, Meaningful Work, and Selected Performance Drivers*. Unpublished PhD Dissertation, Texas A&M University, TX.
- Harris, K. J., Kacmar, K. M. and Zivnuska, S. (2007). 'An investigation of abusive supervision as a predictor of performance and the meaning of work as a moderator of the relationship'. *The Leadership Quarterly*, **18**, 252–63.
- Harrison, D. A., Newman, D. A. and Roth, P. A. (2006). 'How important are job attitudes? Meta analytic comparisons of integrative behavioral outcomes and time sequences'. *Academy of Management Journal*, **49**, 305–25.
- Hedges, L. V. and Vevea, J. L. (1996). 'Estimating effect size under publication bias: small sample properties and robustness of a random effects selection model'. *Journal of Educational and Behavioral Statistics*, **21**, 299–332.
- Higgins, J. P., Thompson, S. G., Deeks, J. J. and Altman, D. G. (2003). 'Measuring inconsistency in meta-analyses'. *BMJ: British Medical Journal*, **327**, 557–60.
- Hirschi, A. (2012). 'Callings and work engagement: moderated mediation model of work meaningfulness, occupational identity, and occupational self-efficacy'. *Journal of Counseling Psychology*, **59**, 479–85.
- Höge, T. and Schnell, T. (2012). 'Kein Arbeitsengagement ohne Sinnerfüllung. Eine Studie zum Zusammenhang von Work Engagement, Sinnerfüllung und Tätigkeitsmerkmalen [No work engagement without meaningfulness. A study on the relationship between work engagement, meaningfulness and job characteristics]'. *Wirtschaftspsychologie*, **1**, 91–99.
- Hu, L. and Bentler, P. M. (1999). 'Cutoff criteria for fit indexes in covariance structure analysis: conventional criteria versus new alternatives'. *Structural Equation Modeling: A Multidisciplinary Journal*, **6**, 1–55.
- Humphrey, S. E., Nahrgang, J. D. and Morgeson, F. P. (2007). 'Integrating motivational, social, and contextual work design features: a meta-analytic summary and theoretical extension of the work design literature'. *Journal of Applied Psychology*, **92**, 1332–56.
- Hunter, J. E. and Schmidt, F. L. (2004). *Methods of Meta-Analysis: Correcting Error and Bias in Research Findings*. Thousand Oaks, CA: Sage.
- Jacobs, H. (2014). *An Examination of Psychological Meaningfulness, Safety, and Availability as the Underlying Mechanisms Linking Job Features and Personal Characteristics to Work Engagement*. Unpublished PhD Dissertation, Florida International University, FL.
- Johnson, M. J. and Jiang, L. (2017). 'Reaping the benefits of meaningful work: the mediating versus moderating role of work engagement'. *Stress and Health: Journal of the International Society for the Investigation of Stress*, **33**, 288–97.
- Johns, G., Xie, J. L. and Fang, Y. (1992). 'Mediating and moderating effects in job design'. *Journal of Management*, **18**, 657–76.
- Kahn, W. A. (1990). 'Psychological conditions of personal engagement and disengagement at work'. *Academy of Management Journal*, **33**, 692–724.
- Kahneman, D. and Krueger, A. B. (2006). 'Developments in the measurement of subjective well-being'. *Journal of Economic Perspectives*, **20**, 3–24.

- Kristensen, T. S., Hannerz, H., Høgh, A. and Borg, V. (2005). 'The Copenhagen Psychosocial Questionnaire – a tool for the assessment and improvement of the psychosocial work environment'. *Scandinavian Journal of Work, Environment, and Health*, **31**, 438–49.
- Lam, C. F., Wan, W. H. and Roussin, C. J. (2016). 'Going the extra mile and feeling energized: an enrichment perspective of organizational citizenship behaviors'. *Journal of Applied Psychology*, **101**, 379–91.
- Lee, M. C. C., Idris, M. A. and Delfabbro, P. H. (2016). 'The linkages between hierarchical culture and empowering leadership and their effects on employees' work engagement: work meaningfulness as a mediator'. *International Journal of Stress Management*, **24**, 1–24.
- Leiter, M. P., Harvie, P. and Frizzel, C. (1998). 'The correspondence of patient satisfaction and nurse burnout'. *Social Science and Medicine*, **47**, 1611–17.
- Lepisto, D. A. and Pratt, M. G. (2017). 'Meaningful work as realization and justification toward a dual conceptualization'. *Organizational Psychology Review*, **7**, 99–121.
- Lipsey, M. W. and Wilson, D. B. (2001). *Practical Meta-Analysis*. Thousand Oaks, CA: Sage.
- Lips-Wiersma, M. (2002). 'The influence of spiritual "meaning-making" on career behavior'. *Journal of Management Development*, **21**, 497–520.
- Lips-Wiersma, M. and Wright, S. (2012). 'Measuring the meaning of meaningful work: development and validation of the Comprehensive Meaningful Work Scale (CMWS)'. *Group and Organization Management*, **37**, 655–685.
- Lips-Wiersma, M., Wright, S. and Dik, B. (2016). 'Meaningful work: differences among blue-, pink-, and white-collar occupations'. *Career Development International*, **21**, 534–51.
- Littman-Ovadia, H. and Lavy, S. (2016). 'Going the extra mile: perseverance as a key character strength at work'. *Journal of Career Assessment*, **24**, 240–52.
- Martela, F. and Pessi, A. B. (2018). 'Significant work is about self-realization and broader purpose: Defining the key dimensions of meaningful work'. *Frontiers in Psychology*, **9**, 363.
- Maslach, C., Schaufeli, W. B. and Leiter, M. P. (2001). 'Job burnout'. *Annual Review of Psychology*, **52**, 397–422.
- Mathieu, J. E. and Zajac, D. M. (1990). 'A review and meta-analysis of the antecedents, correlates, and consequences of organizational commitment'. *Psychological Bulletin*, **108**, 171–94.
- May, D. R., Gilson, R. L. and Harter, L. M. (2004). 'The psychological conditions of meaningfulness, safety and availability and the engagement of the human spirit at work'. *Journal of Occupational and Organizational Psychology*, **77**, 11–37.
- Meyer, J. P., Stanley, D. J., Herscovitch, L. and Topolnysky, L. (2002). 'Affective, continuance, and normative commitment to the organization: A meta-analysis of antecedents, correlates, and consequences'. *Journal of Vocational Behavior*, **61**, 20–52.
- Muthén, L. K. and Muthén, B. O. (1998–2012). *Mplus User's Guide*, 7th edition. Los Angeles, CA: Muthén & Muthén.
- Nielsen, M. L., Rugulies, R., Christensen, K. B., Smith-Hansen, L., Bjorner, J. B. and Kristensen, T. S. (2004). 'Impact of the psychosocial work environment on registered absence from work: a two-year longitudinal study using the IPAW cohort'. *Work and Stress*, **18**, 323–35.
- Oldham, G. R. and Hackman, J. R. (2010). 'Not what it was and not what it will be: the future of job design research'. *Journal of Organizational Behavior*, **31**, 463–79.
- Orwin, R. G. and Vevea, J. L. (2009). 'Evaluating coding decisions'. In Cooper, H., Hedges, L. V. and Valentine, J. C. (Eds), *The Handbook of Research Synthesis & Meta-Analysis*. New York: Russell Sage Foundation, 177–204.
- Pejtersen, J. H., Kristensen, T. S., Borg, V. and Bjorner, J. B. (2010). 'The second version of the Copenhagen Psychosocial Questionnaire'. *Scandinavian Journal of Public Health*, **38**, 8–24.
- Pratt, M. G. and Ashforth, B. E. (2003). 'Fostering meaningfulness in working and at work'. In Cameron, K. S., Dutton, J. E. and Quinn, R. E. (Eds), *Positive Organizational Scholarship*. San Francisco, CA: Berrett-Koehler Publishers Inc, 309–27.
- Renn, R. W. and Vandenberg, R. J. (1995). 'The critical psychological states: An underrepresented component in job characteristics model research'. *Journal of Management*, **21**, 279–303.
- Rodríguez-Muñoz, A., Sanz-Vergel, A. I., Demerouti, E. and Bakker, A. B. (2014). 'Engaged at work and happy at home: a spillover–crossover model'. *Journal of Happiness Studies*, **15**, 271–83.
- Rosenthal, R. (1979). 'The file drawer problem and tolerance for null results'. *Psychological Bulletin*, **86**, 638–41.
- Rosso, B. D., Dekas, K. H. and Wrzesniewski, A. (2010). 'On the meaning of work: A theoretical integration and review'. *Research in Organizational Behavior*, **30**, 91–127.

- Saks, A. M. (2006). 'Antecedents and consequences of employee engagement'. *Journal of Managerial Psychology*, **21**, 600–19.
- Schaufeli, W. B. and Bakker, A. B. (2004). 'Job demands, job resources, and their relationship with burn-out and engagement: a multi-sample study'. *Journal of Organizational Behavior*, **25**, 293–315.
- Scroggins, W. A. (2008). 'Antecedents and outcomes of experienced meaningful work: a person-job fit perspective'. *Journal of Business Inquiry*, **7**, 68–78.
- Shantz, A. and Booth, J. E. (2014). 'Service employees and self-verification: the roles of occupational stigma consciousness and core self-evaluations'. *Human Relations*, **67**, 1439–65.
- Sharpe, D. (1997). 'Of apples and oranges, file drawers and garbage: why validity issues in meta-analysis will not go away'. *Clinical Psychology Review*, **17**, 881–901.
- Shockley, K. M., Ureksoy, H., Rodopman, O. B., Poteat, L. F. and Dullaghan, T. R. (2016). 'Development of a new scale to measure subjective career success: a mixed-methods study'. *Journal of Organizational Behavior*, **37**, 128–53.
- Soane, E., Shantz, A., Alfes, K., Truss, C., Rees, C. and Gatenby, M. (2013). 'The association of meaningfulness, well-being, and engagement with absenteeism: a moderated mediation model'. *Human Resource Management*, **52**, 441–56.
- Spreitzer, G. M. (1995). 'Psychological empowerment in the workplace: dimensions, measurement, and validation'. *Academy of Management Journal*, **38**, 1442–65.
- Steger, M. F. and Dik, B. J. (2010). 'Work as meaning: Individual and organizational benefits of engaging in meaningful work'. In Garcea, N., Harrington, S. and Linley, A. (Eds), *Oxford Handbook of Positive Psychology and Work*. New York: Oxford University Press, 131–42.
- Steger, M. F., Dik, B. J. and Duffy, R. D. (2012). 'Measuring meaningful work: the work and meaning inventory (WAMI)'. *Journal of Career Assessment*, **20**, 322–37.
- Steger, M. F., Littman-Ovadia, H., Miller, M., Menger, L. and Rothmann, S. (2013). 'Engaging in work even when it is meaningless: positive affective disposition and meaningful work interact in relation to work engagement'. *Journal of Career Assessment*, **21**, 348–61.
- Stringer, C. (2008). *The Relationship between Strategic Alignment, Meaningful Work, and Employee Engagement*. Unpublished PhD Dissertation, University of New Mexico, NM.
- Tak, J., Seo, H.-J., Kim, H.-S., Nam, D.-Y., Jung, H.-J., Kwon, N., Kim, S.-Y. and Jung, I. (2017). 'Development and validation of the Work Meaning Inventory'. *The Korean Journal of Industrial and Organizational Psychology*, **28**, 357–72.
- Treadgold, R. J. (1999). 'Transcendent vocations: their relationship to stress, depression, and clarity of self-concept'. *Journal of Humanistic Psychology*, **39**, 81–105.
- Treadgold, R. J. (1997). *Engagement in Meaningful Work: Its Relationship to Stress, Depression, and Clarity of Self-Concept*. Unpublished PhD Dissertation. Saybrook Institute, CA.
- Van Zyl, L. E., Deacon, E. and Rothmann, S. (2010). 'Towards happiness: Experiences of work-role fit, meaningfulness and work engagement of industrial/organisational psychologists in South Africa'. *SA Journal of Industrial Psychology*, **36**, 1–10.
- Watson, D., Clark, L. A. and Tellegen, A. (1988). 'Development and validation of brief measures of positive and negative affect: the PANAS scales'. *Journal of Personality and Social Psychology*, **54**, 1063–70.
- Williamson, J. C. and Geldenhuys, M. (2014). 'Positive work experiences and life satisfaction: the moderating role of gender'. *Journal of Psychology in Africa*, **24**, 315–20.
- Wrzeniewski, A. and Dutton, J. E. (2001). 'Crafting a job: revisioning employees as active crafters of their work'. *Academy of Management Review*, **26**, 179–201.
- Wrzesniewski, A., Dutton, J. E. and Debebe, G. (2003). 'Interpersonal sensemaking and the meaning of work'. *Research in Organizational Behavior*, **25**, 93–135.

APPENDIX A

Table A1. All studies in meta-analysis

<i>Citation</i>	<i>Publication Type</i>	<i>Country</i>	<i>Outcome</i>	<i>Sample size</i>	$r^{Observed}$	$r^{Adjusted}$
Clausen and Borg (2010)	Journal Article	Denmark	Commitment	5262	0.53	0.74
Duffy et al. (2016)	Journal Article	USA	Commitment	361	0.67	0.73
Duffy et al. (2012)	Journal Article	USA	Commitment	201	0.72	0.82
Duffy et al. (2013)	Journal Article	USA	Commitment	553	0.7	0.77
Duffy et al. (2014)	Journal Article	USA	Commitment	1044	0.81	0.88
Fairlie (2011)	Journal Article	Mix: USA and Canada	Commitment	574	0.73	0.78
Goldenhuis et al. (2014)	Journal Article	South Africa	Commitment	415	0.54	0.59
Hammons (2014)	Dissertation	USA	Commitment	1333	0.62	0.73
Scroggins (2008)	Journal Article	USA	Commitment	208	0.67	0.81
Shockley et al. (2016)	Journal Article	USA	Commitment	216	0.61	0.71
Steger et al. (2012)	Journal Article	USA	Commitment	370	0.49	0.54
Chen et al. (2011)	Journal Article	China	Engagement	139	0.61	0.71
Chikoko et al. (2014)	Journal Article	South Africa	Engagement	149	0.61	0.71
Demirtas et al. (2015)	Journal Article	Turkey	Engagement	440	0.68	0.76
Fairlie (2011)	Journal Article	USA and Canada	Engagement	574	0.77	0.81
Goldenhuis et al. (2014)	Journal Article	South Africa	Engagement	415	0.64	0.74
George (2015)	Dissertation	USA	Engagement	240	0.72	0.77
Ghadi et al. (2013)	Journal Article	Australia	Engagement	530	0.68	0.72
Hirschi (2012)	Journal Article	Germany	Engagement	529	0.69	0.75
Jacobs (2014)	Dissertation	USA	Engagement	500	0.84	0.88
Johnson and Jiang (2017)	Journal Article	USA	Engagement	194	0.67	0.71

(Continued)

Table A1 (Continued)

<i>Citation</i>	<i>Publication Type</i>	<i>Country</i>	<i>Outcome</i>	<i>Sample size</i>	$r^{Observed}$	$r^{Adjusted}$
Lee et al. (2016)	Journal Article	Malaysia	Engagement	134	0.48	0.53
Lips-Wiersma and Wright (2012)	Journal Article	New Zealand	Engagement	405	0.69	0.80
May et al. (2004)	Journal Article	USA	Engagement	199	0.63	0.76
Soane et al. (2013)	Journal Article	UK	Engagement	625	0.61	0.65
Steger et al. (2013)	Journal Article	Israel	Engagement	252	0.62	0.70
Stringer (2008)	Dissertation	USA	Engagement	160	0.61	0.71
Van Zyl et al. (2010)	Journal Article	South Africa	Engagement	106	0.7	0.79
Williamson and Geldenhuys (2014)	Journal Article	South Africa	Engagement	800	0.45	0.53
Arnold and Walsh (2015)	Journal Article	Canada	General Health	215	0.5	0.55
Arnold et al. (2007)	Journal Article	Canada	General Health	146	0.44	0.49
Soane et al. (2013)	Journal Article	UK	General Health	625	0.24	0.28
Allan et al. (2018)	Journal Article	USA	Job Satisfaction	212	0.72	0.76
Arnoux-Nicolas et al., 2016a	Journal Article	France	Job Satisfaction	336	0.63	0.72
Duffy et al. (2015)	Journal Article	USA	Job Satisfaction	280	0.68	0.74
Duffy et al. (2012)	Journal Article	USA	Job Satisfaction	201	0.69	0.78
Duffy et al. (2013)	Journal Article	USA	Job Satisfaction	553	0.67	0.72
Duffy et al. (2014)	Journal Article	USA	Job Satisfaction	1044	0.87	0.94
Dwyer et al. (2013)	Journal Article	USA	Job Satisfaction	302	0.54	0.63
George (2015)	Dissertation	USA	Job Satisfaction	240	0.56	0.60
Scroggins (2008)	Journal Article	USA	Job Satisfaction	208	0.59	0.71
Shockley et al. (2016)	Journal Article	USA	Job Satisfaction	216	0.64	0.73

(Continued)

Table A1 (Continued)

<i>Citation</i>	<i>Publication Type</i>	<i>Country</i>	<i>Outcome</i>	<i>Sample size</i>	$r^{Observed}$	$r^{Adjusted}$
Steger et al. (2012)	Journal Article	USA	Job Satisfaction	370	0.56	0.61
Allan et al. (2015)	Journal Article	USA	Life Meaning	926	0.57	0.65
Allan et al. (2016)	Journal Article	USA	Life Meaning	376	0.52	0.64
Arnoux-Nicolas et al. (2016a)	Journal Article	France	Life Meaning	336	0.18	0.22
Duffy et al. (2013)	Journal Article	USA	Life Meaning	553	0.49	0.58
Lips-Wiersma and Wright (2012)	Journal Article	New Zealand	Life Meaning	405	0.19	0.32
Steger et al. (2012)	Journal Article	USA	Life Meaning	370	0.57	0.66
Arnoux-Nicolas et al. (2016a)	Journal Article	France	Life Satisfaction	336	0.33	0.38
Duffy et al. (2013)	Journal Article	USA	Life Satisfaction	553	0.42	0.45
Shockley et al. (2016)	Journal Article	USA	Life Satisfaction	216	0.49	0.58
Steger et al. (2012)	Journal Article	USA	Life Satisfaction	370	0.47	0.51
Williamson and Goldenhuys (2014)	Journal Article	South Africa	Life Satisfaction	800	0.39	0.46
Allan et al. (2018)	Journal Article	USA	Negative Affect	212	-0.12	-0.12
Allan et al. (2016b)	Journal Article	USA	Negative Affect	376	-0.32	-0.32
Steger et al. (2012)	Journal Article	USA	Negative Affect	370	-0.04	-0.04
Treadgold (1997)	Dissertation	USA	Negative Affect	127	-0.19	-0.19
Hammons (2014)	Dissertation	USA	Organizational Citizenship Behaviors	1333	0.37	0.43
Lam et al. (2016)	Journal Article	USA	Organizational Citizenship Behaviors	224	0.26	0.32

(Continued)

Table A1 (Continued)

<i>Citation</i>	<i>Publication Type</i>	<i>Country</i>	<i>Outcome</i>	<i>Sample size</i>	$r^{Observed}$	$r^{Adjusted}$
Steger et al. (2012)	Journal Article	USA	Organizational Citizenship Behaviors	370	0.2	0.23
Allan et al. (2016c)	Journal Article	USA	Self-Rated Job Performance	463	0.24	0.27
Harris et al. (2007)	Journal Article	USA	Self-Rated Job Performance	154	0.47	0.56
Lam et al. (2016)	Journal Article	USA	Self-Rated Job Performance	224	0.25	0.34
Littman-Ovadia and Lavy (2016)	Journal Article	Mix	Self-Rated Job Performance	686	0.25	0.28
Shockley et al. (2016)	Journal Article	USA	Self-Rated Job Performance	216	0.17	0.22
Arnoux-Nicolas et al. (2016b)	Journal Article	France	Withdrawal	336	-0.62	-0.71
Clausen and Borg (2010)	Journal Article	Denmark	Withdrawal	5262	-0.10	-0.12
Hammons (2014)	Dissertation	USA	Withdrawal	1333	-0.58	-0.68
Leiter et al. (1998)	Journal Article	Canada	Withdrawal	711	-0.52	-0.67
Nielsen, et al. (2004)	Journal Article	Denmark	Withdrawal	1919	-0.1	-0.11
Scroggins (2008)	Journal Article	USA	Withdrawal	208	-0.59	-0.76
Shantz and Booth (2014)	Journal Article	UK	Withdrawal	128	-0.37	-0.48
Shockley et al. (2016)	Journal Article	USA	Withdrawal	216	-0.50	-0.56
Soane et al. (2013)	Journal Article	UK	Withdrawal	625	-0.13	-0.13
Steger et al. (2012)	Journal Article	USA	Withdrawal	370	-0.35	-0.38

Notes: USA = United States of America; Mix = Samples from multiple nations; N = Sample size; $r^{observed}$ = reported correlation coefficient; $r^{Adjusted}$ = correlation coefficient correct for measurement unreliability; studies listed multiple times as many studies provided correlations for more than one outcome.

APPENDIX B
Table B1. Meta-analytic correlational matrix

Variable	1	2	3	4	5	6	7
1. Meaningful work	–						
2. Work engagement	0.74a	–					
3. Commitment	0.75a	0.54bc ^(20,926)	–				
4. Job satisfaction	0.66a	0.67bcde ^(31,182)	0.57eghij ^(618,090)	–			
5. OCBs	0.34a	0.33bc ⁽⁶³⁹⁹⁾	0.32gik ^(32,929)	0.29kl ^(23,448)	–		
6. Performance	0.27a	0.43f ⁽⁴⁵⁶²⁾	0.06g ⁽⁸⁰⁶⁶⁾	0.3m ^(54,471)	0.23m ⁽⁹⁹¹²⁾	–	
7. Withdrawal	–0.49a	–0.35c ^(11,359)	–0.38g ^(40,517)	–0.58m ^(35,494)	–0.3m ⁽⁸⁸⁸⁾	–0.26m ⁽⁶⁸³⁾	–

Notes: Values reflect the corrected correlational coefficients from current and past meta-analyses. The values in the parentheses reflect the sample size;

a = current meta-analysis; b = Christian et al. (2011); c = Mackay et al. (2017); d = Nahrgang et al. (2011); e = Joseph et al. (2010); f = Christian et al. (2011); g = Meyer et al. (2002); h = Cooper-Hakim and Viswesvaran (2005); i = Cetin et al., 2015; j = Mathieu and Zajac, 1990; k = LePine et al. (2002); l = Harrison et al. (2006); m = Zhao et al. (2007). The number of letters superscript next to the correlational values represent the number of meta-analyses that were referenced in order to calculate the value.

APPENDIX C

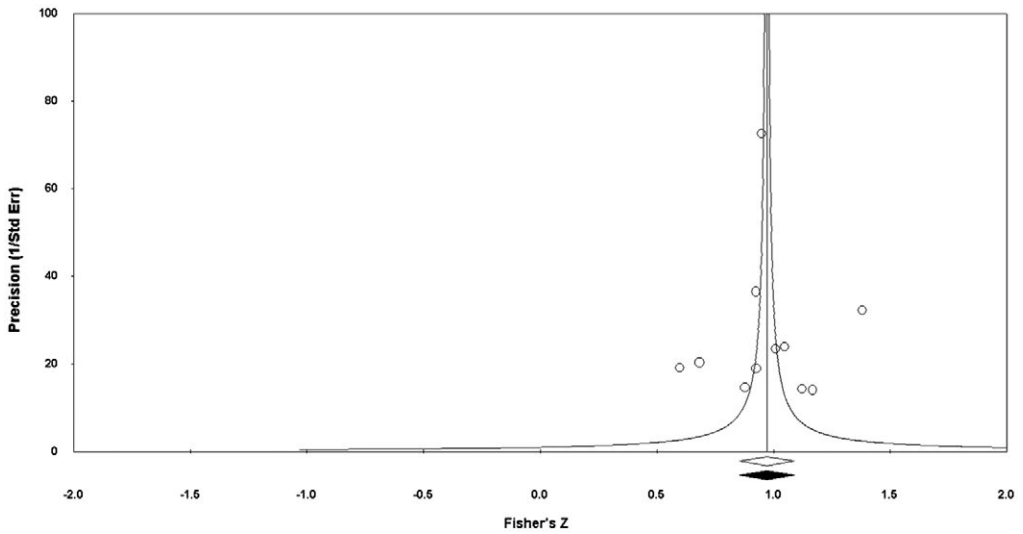


Figure C1. Commitment publication bias funnel plot

Note: Meta-analytic effect size values corrected for unreliability. White circles represent individual studies, and Black circles represent imputed studies based on trim and fill results (none imputed). Centre line based on average correlation coefficient for included studies. Figure demonstrates symmetry.

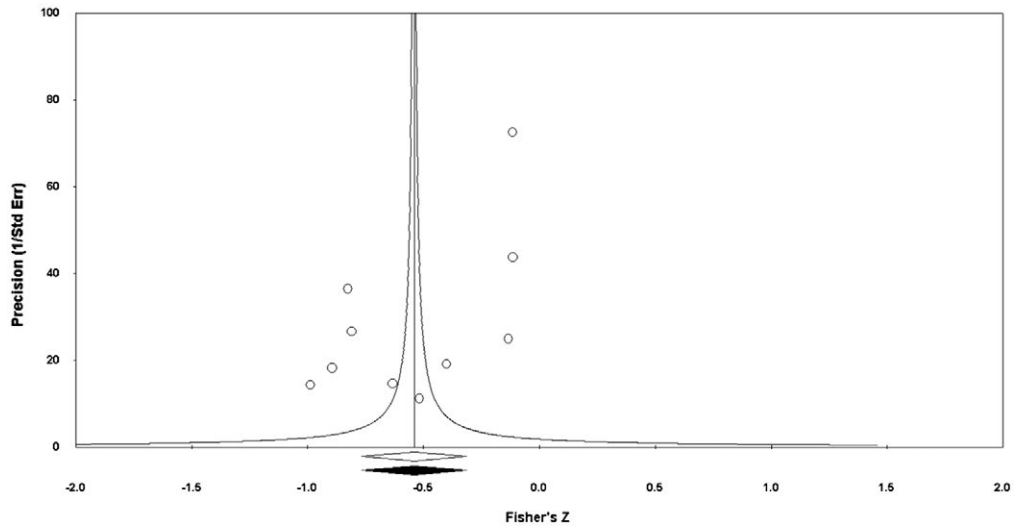


Figure C2. Withdrawal publication bias funnel plot

Note: Meta-analytic effect size values corrected for unreliability. White circles represent individual studies, and Black circles represent imputed studies based on trim and fill results (none imputed). Centre line based on average correlation coefficient for included studies. Figure demonstrates symmetry.

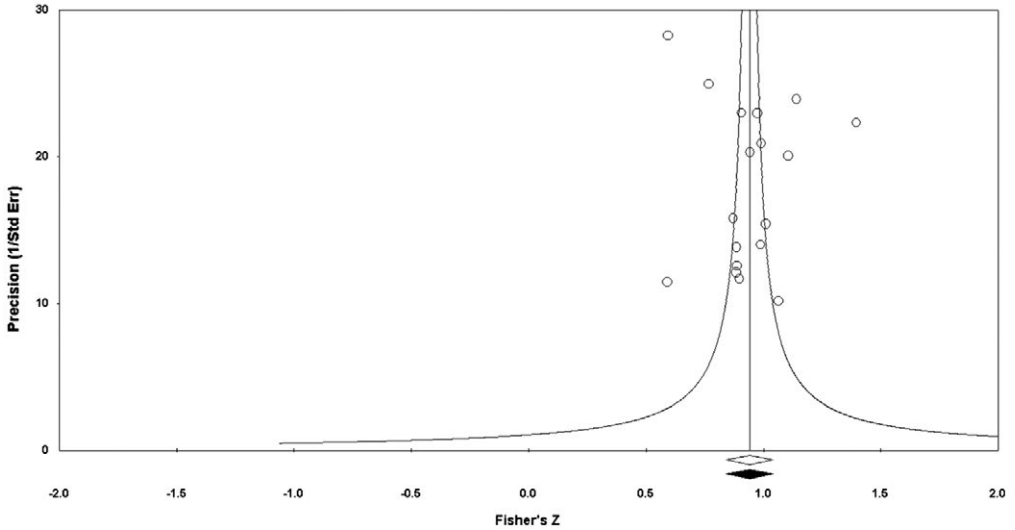


Figure C3. Engagement publication bias funnel plot

Note: Meta-analytic effect size values corrected for unreliability. White circles represent individual studies, and black circles represent imputed studies based on trim and fill results (none imputed). Centre line based on average correlation coefficient for included studies. Figure demonstrates symmetry.

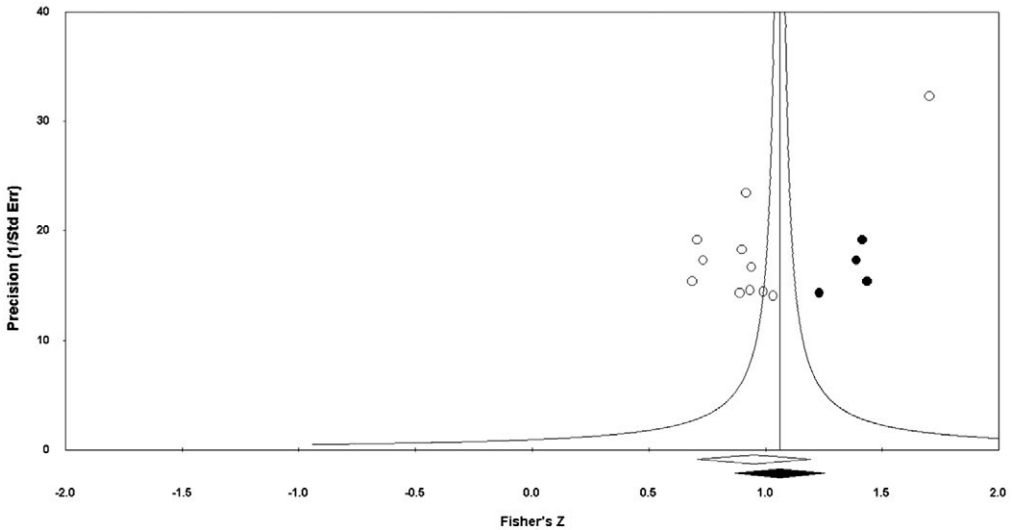


Figure C4. Job satisfaction publication bias funnel plot

Note: Meta-analytic effect size values corrected for unreliability. White circles represent individual studies, and black circles represent imputed studies based on trim and fill results (none imputed). Centre line based on average correlation coefficient for included studies. Figure demonstrates lack of symmetry, such that publication bias has resulted in a smaller reported effect size (white diamond) and when corrected results in a larger effect size (black diamond).

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