Motivation and Emotion (2021) 45:60–74
https://doi.org/10.1007/s11031-020-09850-6

ORIGINAL PAPER

Job crafting, leader autonomy support, and passion for work: Testing a model in Australia and China

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Published online: 22 July 2020

Abstract
Building on the dualistic model of passion Vallerand (The psychology of passion: A dualistic model. Oxford University Press, New York, 2015), we examined a hypothesized model whereby harmonious and obsessive passion mediate the relationships of job crafting and leader autonomy support with work engagement and burnout in both Australian and Chinese work samples. Compared with four alternative models, our results supported the hypothesized model as the best fitting model in both samples, showing cross-sample invariance of factor loadings and regression paths. Across both samples, job crafting and leader autonomy support positively predicted harmonious passion, yet exhibited disparate relations with obsessive passion. Both forms of passion positively predicted work engagement, yet only obsessive passion positively predicted burnout. Findings are consistent with the notion that job crafting is an approach that employees use to internalize harmonious and obsessive passions into work identities, which have corresponding and disparate impacts on work engagement and burnout across cultures.

Keywords Job crafting · Leader autonomy support · Dualistic model of passion · Work engagement · Burnout

Introduction

Over the past decade, the job design literature has expanded to suggest that employees are not just passive recipients of their work, but instead are active, self-directed agents who craft job boundaries to create a new work experience for themselves (e.g., Slemp 2017; Slemp and Vella-Brodrick 2014; Wrzesniewski and Dutton 2001). This process, known as job crafting, is described as "the physical or cognitive changes that employees make to the task or relational boundaries of their work" (Wrzesniewski and Dutton 2001, p. 179). While the job crafting literature has comprehensively explored the antecedents and consequences of job crafting strategies (see Zhang and Parker 2019; Lichtenthaler and Fischbach 2018, 2019), few studies have explored specific motivational underpinnings that explain relations between job crafting and desired and undesired outcomes in the workplace (cf. Bindl et al. 2018; Slemp and Vella-Brodrick 2014), as well as how job crafting interrelates with leader supports to nurture disparate motivational processes, such as adaptive and maladaptive forms of passion (Vallerand 2015; Vallerand and Houlfort 2019). It was our aim to take steps toward addressing this gap in the present study.

In the present study, we examine a model in which job crafting and leader autonomy support predict harmonious and obsessive passion for work, which, in turn, predict employee engagement and burnout in Chinese and Australian samples. We focus on China and Australia as these two regions offer two work contexts that differ in work dynamics and patterns of proactive behavior, which will help to establish the generalizability of our proposed model (Zhang et al. 2015). We contribute to the literature by helping to confirm the generalizability of job crafting and leader autonomy support relations with motivational processes and employee well-being.

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Leader supports and job crafting

Job crafting describes a process by which employees take an active role in initiating changes to their approach to work. While various models of job crafting exist (see Zhang and Parker 2019), Wrzesniewski and Dutton's (2001) original conceptual model of job crafting included three strategies: task, relational, and cognitive crafting. Task crafting involves initiating changes to the number or types of activities one undertakes. Relational crafting involves exercising discretion about whom one interacts at work, or how one does so. Cognitive crafting, by contrast, involves altering how one 'sees' their job, with the view to shifting how the tasks or relationships that comprise the job are perceived. The three job crafting strategies represent unique ways in which employees redefine their jobs in order to enhance their work experiences (Bindl et al. 2018; Wrzesniewski and Dutton 2001). We focus on this model of job crafting because it captures cognitive crafting—a facet omitted in other job crafting models (Slemp and Vella-Brodrick 2013; Zhang and Parker 2019). Indeed, shaping cognitions about work via cognitive crafting is an important process through which employees shape their work identity, potentially creating a more meaningful and fulfilling work experience (Slemp and Vella-Brodrick 2013; Wrzesniewski and Dutton 2001).

A vast literature suggests that job crafting is related to valued outcomes in the workplace, including performance, work engagement, and employee well-being (see Lichtenthaler and Fischbach 2018; Rudolph et al. 2017). Studies are also beginning to uncover a variety of antecedences to job crafting (see Zhang and Parker 2019), one of which is the leadership style to which the job crafter is subjected. In particular, leaders can empower proactivity when they nurture employee autonomy (e.g., Slemp et al. 2015; Thun and Bakker 2018), a style embodied by *leader autonomy support* (Slemp et al. 2018). Leader autonomy support refers to a cluster of interpersonal leader behaviors that nurture inner motivational resources in employees, thus facilitating the self-determination of behavior (Ryan and Deci 2017). An autonomy supportive leader will provide workers with a sense of choice and opportunities for input, encourage more discretionary and self-initiated behaviors, take steps to acknowledge worker perspectives, communicate in an informational manner, and minimize the use of external controls, such as tangible rewards or sanctions, to motivate desired job behaviors (Deci and Ryan 1987; Deci et al. 1989; Slemp et al. 2018).

As a leadership style, autonomy support should elicit more job crafting behaviors because it frees up in employees the cognitive restraints about what can or ought to be done in the workplace, thus prompting more exploratory, imaginative, potentially creative work behaviors that push job boundaries (Slemp et al. 2015). Such a premise is consistent with studies that show job crafting behaviors increase when employees have the autonomy to enact them (e.g., Demerouti et al. 2015; Petrou et al. 2012). Yet, at the same time, to the extent that autonomy comes from leader behavior, the causal direction of the relationship is likely to be bi-directional, in which case employees could craft a more autonomy supportive style into their leader. As examples, it is possible that employees often invite greater decision-latitude, opportunities for choice, or ownership over their role, which could trigger a more autonomy supportive style in the leader. The bi-directionality of this relation is supported by quantitative (Slemp et al. 2015) and qualitative (Berg et al. 2010) studies, which both converge to show that employees use job crafting strategies to push leader behavior toward allowing for greater ownership of work activities, thus lessening the constraints imposed on their role.

Theoretical underpinning: The dualistic model of passion

Job crafting and leader autonomy support offer a mutually supportive mechanisms that could, in turn, foster different types of passion for work. In the present study, we examine this alongside the Dualistic Model of Passion (DMP; Vallerand et al. 2003; Vallerand 2015), which describes passion as a strong inclination towards a specific activity that one loves, values, and invests substantial time and energy. The DMP differentiates two types of passion, each explaining different degrees to which an activity has been internalized. *Harmonious passion* describes an adaptive form of passion that is in harmony with other aspects life. It emerges from complete behavioral integration, whereby an activity and its outcomes are autonomously internalized to the extent that they are concordant with inner values and goals (Ryan and Deci 2000; Vallerand et al. 2003). Thus, harmonious passion reflects activities that people are passionate about yet freely choose to do, typically because they derive from the activity a deep sense of enjoyment and satisfaction, and because it represents "who they are" (Houlfort et al. 2014). Harmonious passion fuels motivation and task engagement and is thus thought to provide the basis for a balanced and purposeful life (Curran et al. 2015; Vallerand 2015).

Obsessive passion, in contrast, describes a maladaptive form of passion that is typically in conflict with other aspects of life. It entails a controlled internalization of the activity that one loves and thus emerges from a partial rather than complete behavioral integration. Due to this, the activity is often driven by ego-involved motives and contingent on factors such as self-esteem maintenance, achieving social approval, or high performance (Fernet et al. 2014). Hence,

while obsessive passion involves a love for the activity, it can involve a compulsion to engage in it that overspills into rigid persistence and obsession—typically serving an end other than the activity itself (Curran et al. 2015).

While both harmonious passion and obsessive passion are deeply energizing, due to their divergent patterns of internalization they each tend to lead to different intrapersonal outcomes. For example, while harmonious passion tends to foster adaptive outcomes (e.g., flow, engagement, heightened concentration) obsessive passion comes at a cost. As evidence of this, Curran et al. (2015) demonstrated in their meta-analysis that while both harmonious and obsessive passion are positively related with intrinsic motivation, flow, deliberate practice, and performance, it was only obsessive passion that predicted higher-levels of anxiety, negative affect, rumination, and conflict with other areas of life. Similarly, obsessive passion was related to lower self-esteem, likely reflecting that a deficit in self-esteem can act as a motivational precursor to obsessive passion.

Similar findings are evident in the workplace (see Vallerand and Houlfort 2019). That is, harmonious passion is typically related to favorable outcomes, including job satisfaction (Houlfort et al. 2014) flow (e.g., Lavigne et al. 2012) and creativity (Liu et al. 2011). Yet, it is only obsessive passion that is commonly related to maladaptive outcomes, including work-related burnout (e.g., Fernet et al. 2014; Lavigne et al. 2012) depression (e.g., Houlfort et al. 2014) turnover intentions (Houlfort et al. 2014) and work/family interference (e.g., Caudroit et al. 2011). While no studies to our knowledge have yet examined how job crafting relates to either harmonious or obsessive passion, we expect job crafting to positively relate to both harmonious and obsessive passion. This is because job crafting could be used to help employees create harmony between their work and their lives in general, and is consistent with studies showing that employees enact job crafting strategies to create better alignment between their work activities and the self (Tims et al. 2016). On the other hand, job crafting could also foster more obsessive passion for work, particularly if underlying motives to enact job crafting strategies are ego-contingent, driven by performance-avoidance intentions, or deficits in self-esteem (Bélanger et al. 2013; Vallerand 2012). Several studies have shown that job crafting can be enacted in both adaptive and maladaptive ways (e.g., Demerouti et al. 2015; Dierdorff and Jensen 2018; Petrou et al. 2015 Tims et al. 2015a, b), and, thus, we expect that job crafting can be conducted in ways that foster both types of passion.

Whereas we expect job crafting to relate positively to both forms of passion, we expect that leader autonomy support will exhibit a much stronger positive relation with harmonious than obsessive passion (Liu et al. 2011; Vallerand 2015; Vallerand and Rahimi in press). This is because the provision of autonomy tends to nurture an autonomous internalization of behavior, which is consistent with harmonious passion, but not obsessive passion (Liu et al. 2011). Similarly, the provision of leader autonomy support helps to nurture a universal human psychological need for autonomy (Deci et al. 2001; Slemp et al. 2018), which should yield positive outcomes for employees. By contrast, a controlling leader who attaches reward or punishment contingencies to an activity creates in the employee an internal pressure to engage in it, which ordains a controlled internalization of the activity, consistent with obsessive passion.

Model generalizability

While growing literatures now exist on both job crafting and the dualistic model of passion, less is known about the integration of the two, and in particular whether findings generalize beyond the West. For research on discretionary behaviors such as job crafting, which interact with social contextual factors such as leadership (Johns 2006; Slemp et al. 2015) cross-cultural research is important because it helps to test the generalizability of our proposed model in contexts characterized by both individualist and collectivist cultural norms (Markus and Kitayama 1991; Nisbett et al. 2001). For our purposes, we focus on Australia and China due to their largely different work dynamics. For example, it is possible that a more traditional cultural emphasis in China discourages discord and disagreement, and instead ordains a more hierarchical working order that has the potential to reduce employee proactive behavior (Farh et al. 1997; Zhang et al. 2015), such as job crafting. Similarly, leadership dynamics differ across regions with a paternalistic style—characterized by strong discipline, authority through moral integrity, and fatherly benevolence (Cheng et al. 2004)—thought to be more common in China (Zhang et al. 2015). Thus, whether or not relations of autonomy supportive leader behaviors and job crafting to passion and well-being outcomes generalize across contexts needs to be established.

The same applies for intrapersonal outcomes of both forms of passion in work settings. While cross-cultural work on passion has tended to replicate Western findings (Vallerand 2015; Vallerand and Rahimi in press), further work is still needed with work samples. The existing studies on Chinese samples have suggested that, similar to the West, harmonious passion is more related to favorable outcomes (e.g., flow, positive affect, job satisfaction; Burke et al. 2015; Zhao et al. 2015) than obsessive passion, which tends to yield unfavorable outcomes, such as negative affect (Vallerand 2015). On the basis of this research, we expect obsessive passion will be related positively with burnout and engagement across cultures, whereas harmonious passion will be positively associated with engagement and negatively associated with burnout.

Study aims and hypothesized model

The aim of the present study was to examine a model whereby job crafting and leader autonomy support represent mutually supportive predictors of harmonious and obsessive passion for work, which, in turn, represent related predictors of work engagement and burnout. To test the generalizability of our model, we also test the pattern of effects across both Western and East Asian work contexts, focusing on Australia and China. The model is depicted graphically in Fig. 1a.

As shown in Fig. 1a, it is hypothesized that job crafting and leader autonomy support will exhibit a positive, bi-directional relationship consistent with the premise that they are mutually reinforcing (Berg et al. 2010; Slemp et al. 2015). In turn, we expect job crafting and leader autonomy support will differentially predict the autonomous or controlled internalization of work behavior, reflected by harmonious and obsessive passion. In particular, we expect job crafting to be positively associated with both forms of passion, reflected by the fact that it can be enacted in adaptive and maladaptive ways, whereas leader autonomy support will exhibit a positive relation with harmonious passion and a negative association with obsessive passion. Finally, we expect both forms of passion to differentially predict work engagement and job burnout across cultures. Consistent with past research, we expect that harmonious passion will be positively associated with work engagement and negatively with job burnout, whereas obsessive passion should positively predict both work engagement and job burnout.

While this pattern of associations is one possibility, we examine the hypothesized model against several alternative models that could also explain the data (see Fig.1b–e). First, we examine our hypothesized model against a model (Fig. 1b) in which harmonious and obsessive passion are positioned as the exogenous predictor variables. Such a model is consistent with the premise that both forms of passion could serve as motives for job crafting, and the overt display of harmonious and obsessive passion at work may inspire different behaviors in the leader, such as autonomy support, which, in turn, has implications for work engagement and burnout. We also examine three other plausible models that are represented by serial mediator sequential processes and could also explain the data. First, in Fig. 1c we examine a model where leader autonomy support is the sole exogenous antecedent, which gives rise to job crafting. Job crafting, in turn, predicts harmonious and obsessive passion, which then predicts burnout and work engagement. Such a model is consistent with the notion that leader autonomy support creates the necessary conditions to foster job crafting, which then predicts harmonious and obsessive passions for work, which has implications for work engagement and burnout. Another possibility (Fig. 1d) is a model in which job crafting and is the sole exogenous antecedent that predicts leader autonomy support, which, in turn, predicts both forms of passion, and then work engagement and burnout. This model is consistent with the notion that employees craft more autonomy supportive behaviors into their leader, which in turn fosters different forms of passion, and ultimately work engagement and burnout. A final alternative (Fig. 1e) is a model in which leader autonomy support is the exogenous antecedent, predicting passion, which then serves as a motive for job crafting. To the extent that our hypothesized model fits the data better than these plausible alternative models in both samples, it provides more support for the hypothesized patterns of associations across both work contexts.

Method

Participants and procedure

We recruited two samples of participants: one from the city of Melbourne, Australia ($N = 298$) and another from Beijing, China ($N = 228$), of whom most provided demographic information (Australia 97%; China 99%). The Australian sample comprised employees from a variety of occupational settings. Participants were recruited through several mediums, including by email invitations from organizational representatives who explained the purpose of the study accompanied with a link to participate, as well as noticeboards, and snowballing. Of those who provided demographics, 66% were female and the average age was 34.10 years ($SD = 11.70$ years). Most worked in education (33.33%), professional services (22.59%), and healthcare (12.96%). The average annual income was $66,466 AUD ($SD = $53,277). The vast majority of participants identified as White/Caucasian (65.42%) and the next most represented ethic group were Asian Australians (26.44%). Most participants worked on a full-time basis (54.61%) and on average participants worked 32.07 h per week ($SD = 16.39$ h). Average organizational tenure was 5.88 years ($SD = 5.58$ years) and average career tenure was 7.02 years ($SD = 6.26$ years).

The Chinese sample also comprised employees from mixed of occupational settings. Participants were recruited through several mediums, including by email invitations from organizational representatives who explained the purpose of the study accompanied with a link to participate, as well as noticeboards, and snowballing. Of those who provided demographics, 33% were female and the average age was 28.97 years ($SD = 5.05$ years). Most worked in information technology (33.33%), professional services (12.28%), and administration (4.82%). The average annual income was ¥73,146 RMB ($SD = $¥79,652). Most worked on a full-time basis (98.25%) and on average participants worked 37.61 h per week ($SD = 14.96$ h). Average organizational tenure was

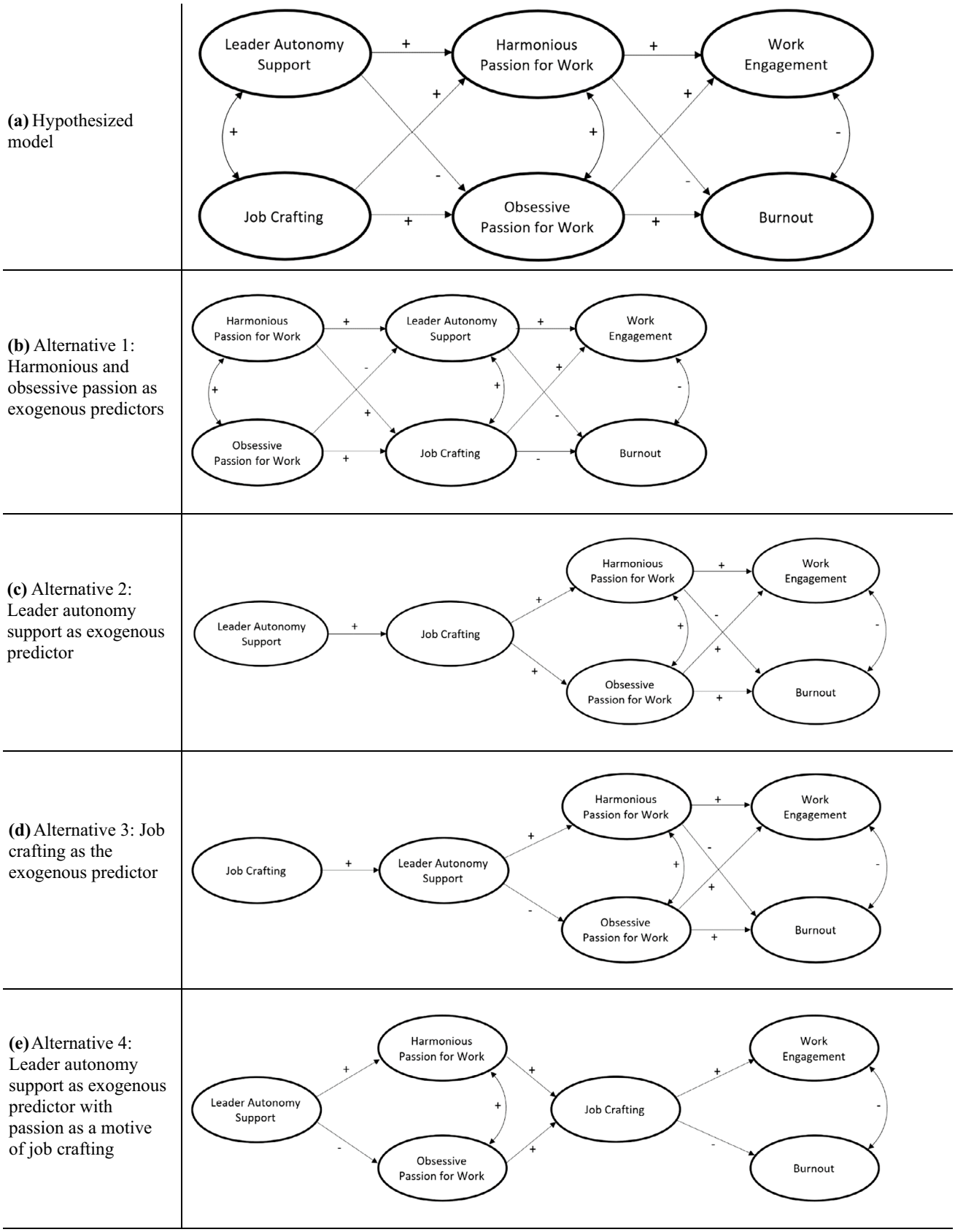

Fig. 1 Hypothesized model (**a**) shown compared to four alternative models (**b**–**e**)

3.07 years (*SD* = 2.80 years) and average career tenure was 5.35 years (*SD* = 4.04 years).

Measures

Participants completed measures of leader autonomy support, job crafting, harmonious and obsessive passion, burnout, and work engagement. In China, we used the available translated measures for Passion (Zhao et al. 2015), burnout (Yeh et al. 2007), and work engagement (Yi-Wen and Yi-Qun 2005). Because the job crafting and leader autonomy support measures did not have Chinese translated items at the time of the study, we translated the items in these scales using the back-translation procedure (Brislin 1970). Scale descriptives and Cronbach's alpha reliability coefficients for each measure can be found in Table 1 for both samples.

Leader autonomy support

We measured leader autonomy support with the 21-item Perceived Autonomy Support Scale for Employees (PASS-E; Moreau and Mageau 2012), which contains items designed to assess the degree to which employees perceive their direct manager to support their autonomy. The scale has two factors with 9-items that measure leader autonomy support and 12-items that measure interpersonal control. For this study, only the leader autonomy support items were used (Cronbach's α: Australia = .91; China = .79). A sample items is: "My supervisors give me many opportunities to make decisions in my work". Responses are recorded on a 7-point scale (1 = strongly disagree, 7 = strongly agree).

Job crafting

We measured job crafting with the 15-item job crafting questionnaire (JCQ; Slemp and Vella-Brodrick 2013), which is now available in several languages (e.g., Letona-Ibañez et al. 2019; Schachler et al. 2019). Items represent different types of job crafting behavior and respondents indicate the frequency with which they enact each behavior on a 6-point scale (1 = hardly ever, 6 = very often). Items load onto three factors (task, relational, and cognitive crafting), but because our primary goal was to examine the consequences of job crafting in general, rather than any specific factor, in our study we used an overall composite of job crafting (Cronbach's α: Australia = .88; China = .86). The three subscales are *task crafting* ("I introduce new tasks that better suit my skills or interests"; Cronbach's α: Australia = .73; China α = .69) *relational crafting* ("I make friends with people at work who have similar skills or interests"; Cronbach's α: Australia = .79; China = .61), and *cognitive crafting* ("I think about how my job gives my life purpose"; Cronbach's α: Australia = .85; China = .77). Prior research supports the factorial and convergent validity of the scale (Slemp and Vella-Brodrick 2013). Composites were created by averaging the relevant items for each job crafting subscale, which were subsequently used as the three observed variables for the latent variable *job crafting*.

Passion

Harmonious and obsessive passion were measured with the Passion Scale (Marsh et al. 2013), which we adapted to the workplace context. This scale consists of two subscales to

Table 1 Variable descriptives and scale intercorrelations for both samples

	Variables	1	2	3	4	5	6	7	8	9
1	Job crafting	–	.37	.58	.23	− .32	.51	.09	− .11	− .11
2	Leader aut. support	.40	–	.61	.06	− .38	.40	− .07	.00	.07
3	Harmonious passion	.58	.49	–	.29	− .48	.60	.01	.00	.02
4	Obsessive passion	.28	− .01	.29	–	− .06	.23	.12	.04	− .05
5	Burnout	− .17	− .34	− .46	.09	–	− .55	.01	− .05	− .02
6	Work engagement	.63	.45	.72	.34	− .44	–	.02	.05	− .05
7	Hours weekly	.29	.22	.16	.21	.10	.22	–	.09	− .07
8	Age	.18	.13	.24	.11	− .10	.24	.42	–	− .15
9	Gender	.03	− .06	− .02	− .08	.08	.03	− .02	− .09	–
	Australia (α)	.88	.91	.90	.78	.88	.92	–	–	–
	China (α)	.86	.79	.81	.69	.73	.91	–	–	–
	Australia *M (SD)*	4.12 (.85)	4.96 (1.22)	4.55 (1.37)	2.64 (1.15)	2.94 (.69)	4.78 (1.21)	32.07 (16.39)	34.10 (11.70)	–
	China *M (SD)*	3.68 (.66)	4.26 (.81)	4.36 (.97)	3.77 (0.87)	2.80 (.53)	3.53 (.99)	37.61 (14.96)	28.97 (5.05)	–

Australia (*N* = 298), China (*N* = 228). Australian data are below the diagonal, Chinese data are above the diagonal. Gender (0 = male, 1 = female). Leader aut. support = Leader autonomy support; Job crafting is a composite of all job crafting items across the task, relational, and cognitive crafting facets. Work engagement is a composite of all work engagement items across the vigor, dedication, and absorption facets

assess harmonious passion (Cronbach's α: Australia = .90; China = .81) and obsessive passion (Cronbach's α: Australia = .78; China = .69), which contain 6-items each. Sample items are: "My work is in harmony with the other activities in my life" (harmonious passion), and "I have difficulties controlling my urge to do my work" (obsessive passion). Responses are recorded on a 7-point scale (1 = do not agree at all, 7 = totally agree). Prior research supports the validity of the scale (Marsh et al. 2013; Vallerand 2015; Vallerand and Rahimi in press).

Work engagement

Work engagement was measured with the 9-item Utrecht Work Engagement Scale (UWES; Schaufeli et al. 2006). The full measure (Cronbach's α: Australia = .92; China = .91) consists of three subscales of 3-items each. The *Vigor* subscale measures employees' level of energy at work ("At my work, I feel bursting with energy"; Cronbach's α: Australia = .83; China = .77). The *Dedication* subscale measures the employees' involvement and enthusiasm about their work ("I am enthusiastic about my job"; Cronbach's α: Australia = .90; China = .76), and the *Absorption* subscale measures employees' engrossment in their work ("I am immersed in my work"; Cronbach's α: Australia = .71; China = .79). Responses are recorded on a 7-point scale from (1 = never, to 7 = always). Like job crafting, composite scores for each work engagement sub-scale were calculated by averaging the relevant items and were subsequently used as the three observed variables for the latent variable *work engagement*. Prior research has supported the validity and reliability of the scale (Seppälä et al. 2009).

Burnout

We measured burnout with the Copenhagen Burnout Inventory (CBI; Kristensen et al. 2005), which consists of three subscales that represent personal, work-related, and client-related burnout. In our study, only the work-related burnout subscale was used (Cronbach's α: Australia = .88; China = .73), which contains 7-items. A sample item is: "Is your work emotionally exhausting?" and responses are recorded with a 5-item scale (1 = to a very low degree, 5 = to a very high degree). The CBI has very good psychometric properties and was designed for use across cultures and different occupations (Kristensen et al. 2005), and is thus well suited to our research context.

Data analysis strategy

We used structural equation modeling (SEM) to test the hypothesized model in both samples. We followed the Anderson and Gerbing (1988) two-step approach to SEM by first validating the measurement models before adding the structural components. SEM analyses were performed using the lavaan package (Rosseel 2012) of the open source R software (version 3.5.0), using the R-Studio interface (Version 1.1.453), and maximum likelihood estimation. Values for missing data were estimated using maximum likelihood methods concurrent to model testing (Rosseel 2012).

Four fit indices were used to test the fit of the measurement and structural models: the comparative fit index (CFI; Bentler 1990), the Tucker-Lewis index (TLI; Tucker and Lewis 1973), root mean square error of approximation (RMSEA; Browne and Cudeck 1993), and the standardized root mean square residual (SRMR; Kline 2015). While there is disagreement about exact cut-off values for these criteria, general rules of thumb for acceptable fit are indicated by values at around 0.90 or above for the TLI and the CFI, as well as values at around 0.08 or below for the RMSEA and the SRMR (Hu and Bentler 1999). Values above 0.10 for the SRMR or RMSEA should lead to model rejection (Kline 2015).

Results

Variable descriptives and preliminary analyses

For both samples, variable descriptives and intercorrelations are presented in Table 1. Composite scores were calculated for each variable by adding the values across each item in each scale and dividing this by the total number of items used in that scale.

Correlations were in expected directions and showed positive associations between job crafting, leader autonomy support, harmonious passion, and work engagement in both samples. While job crafting was positively related to obsessive passion in both samples, leader autonomy support was essentially unrelated with it. Similarly, whereas obsessive passion was positively related with work engagement in both samples, it was not significantly related with burnout in either sample. Harmonious passion was strongly positively related to work engagement, and strongly negatively associated with burnout in both samples.

Validating the measurement models

Before testing the hypothesized structural model (Fig. 1a), Anderson and Gerbing's (1988) two-step approach to SEM requires satisfactory measurement models for each variable. Because including every item for each measure would result in an unsatisfactory number of parameters in the model (Kline 2015), we needed to develop more parsimonious measurement models before validating the hypothesized structural model. To do this, we randomly split

the Australian sample into an exploratory ($N = 155$) and a confirmatory sample ($N = 143$). In the exploratory sample, we used exploratory factor analysis (EFA) with principal components estimation to identify the three items with the highest factor loadings for each variable, which were then tested with CFA in the confirmatory sample. This process allowed us to develop parsimonious measurement models for each variable before confirming the factorial validity of each model in the confirmatory sample (Anderson and Gerbing 1988). We followed this procedure for all variables except job crafting and work engagement, which were modelled using the three composite indicators that reflect each facet of their respective constructs. In the second step, we used SEM to test the full structural models shown in Fig. 1 in the complete Australian and Chinese samples (Anderson and Gerbing 1988).

Using this procedure, the full measurement model with all constructs specified as correlated latent variables showed an adequate fit to the data in the confirmatory sample (χ^2 (120) = 249.793, $p < 0.001$, CFI = 0.914, TLI = 0.891, SRMR = 0.089, RMSEA = 0.087 [CI 0.072 – 0.102]). We next combined the exploratory and confirmatory samples into a full set ($N = 298$) and examined the same measurement model in the full sample, which fit the data well: χ^2 (120) = 268.880, $p < 0.001$, CFI = 0.951, TLI = 0.937, SRMR = 0.064, RMSEA = 0.065 [CI 0.054 – 0.075]. Having confirmed the measurement models in the Australian sample, we next confirmed the corresponding items in the same full measurement model in the Chinese sample ($N = 228$). This model also fit the data well: χ^2 (120) = 179.828, $p < 0.001$, CFI = 0.960, TLI = 0.949, SRMR = 0.053, RMSEA = 0.047 [CI = 0.032 – 0.060].

Standardized and unstandardized factor loadings for the full measurement model in both samples are shown in Table 2. Most of the standardized loadings were consistently high ($\beta > .70$), showing factorial validity. Similarly, estimated factor covariances ranged from − .56 to .76 (Australia) and − .61 to .69 (China), thus showing discriminant validity and no evidence of multicollinearity. Overall, this process confirmed parsimonious and valid measurement models before examining the structural components of the models.

Testing the hypothesized structural model

Before running the structural models, we examined demographic variables (age, weekly hours worked, gender) as possible covariates (Table 1). We controlled for any covariate that was at least moderately related ($r \geq .20$; Gignac and Szodorai 2016) in either sample to any of the focal variables by estimating paths between these pairs of variables in the model. Using this approach, paths were specified between weekly hours worked and job crafting, obsessive passion, and work engagement. We also specified paths between age and harmonious passion, as well as work engagement. Finally, we allowed weekly hours worked and age to covary to account for their correlation in the Australian sample.

Table 2 Standardized and unstandardized factor loadings for the full measurement model in both samples

Latent variable	Observed variable	*B*	*SE*	*β*
Job crafting	Task crafting	1.00	–	.72 (.77)
Job crafting	Relational crafting	1.10 (.97)	.11 (.09)	.62 (.72)
Job crafting	Cognitive crafting	1.54 (1.31)	.13 (.11)	.85 (.86)
Leader autonomy support	LAS1	1.00	–	.89 (.63)
Leader autonomy support	LAS2	.94 (1.12)	.06 (.18)	.84 (.71)
Leader autonomy support	LAS3	.61 (.70)	.06 (.12)	.61 (.50)
Harmonious passion	HP1	1.00	–	.89 (.61)
Harmonious passion	HP2	1.03 (1.18)	.05 (.16)	.90 (.70)
Harmonious passion	HP3	.85 (1.22)	.05 (.16)	.80 (.71)
Obsessive passion	OP1	1.00	–	.71 (.73)
Obsessive passion	OP2	.90 (.93)	.10 (.17)	.72 (.69)
Obsessive passion	OP3	.86 (.72)	.09 (.13)	.66 (.53)
Work engagement	Vigor	1.00	–	.89 (.88)
Work engagement	Dedication	1.12 (1.08)	.05 (.06)	.93 (.91)
Work engagement	Absorption	.73 (1.04)	.05 (.06)	.75 (.87)
Burnout	Burn1	1.00	–	.90 (.69)
Burnout	Burn2	.82 (.67)	.05 (.13)	.80 (.49)
Burnout	Burn3	.79 (1.02)	.06 (.15)	.75 (.67)

Chinese data are shown in parentheses. Task, relational, and cognitive crafting are composites of all items across each facet. Vigor, dedication, and absorption are composites of all items across each facet

We next tested the full hypothesized structural model shown in Fig. 1a. As can be seen in the figure, the hypothesized SEM model included two correlated exogenous variables (leader autonomy support and job crafting), as well as two endogenous mediating variables (harmonious and obsessive passion), and two endogenous outcome variables (work engagement and burnout). Results supported the hypothesized model in both samples, as shown in the top two rows for each sample in Table 3.

Because it is also possible that different patterns of causal relationships better explain the data, we tested the hypothesized model against several alternative models (shown in Fig. 1b–e). Model comparisons were completed using standard fit indices and chi-square. For example, change in chi-square, or deterioration in fit indices (e.g., lower CFI or TLI, higher RMSEA and SRMR) shows evidence of a poorer fitting model. As shown in Table 3, while generally acceptable, the alternative models showed poorer fit to the data than the hypothesized model in both samples (Table 3). It is also noteworthy that, across both samples, the alternative models showed similar deterioration of fit, relative to the hypothesized model.

Model invariance across Australian and Chinese samples

Having established that the hypothesized model fit the data best in both samples, we next performed invariance analyses across samples to determine the equivalence of the factor loadings and structural paths across countries. To do this, we used the guidelines of both Little (1997) and Bollen (1989), who suggested performing invariance analyses across samples by performing hierarchically organized comparisons with progressively more constraints imposed across the samples. This is the same procedure as used in other studies involving multi-group comparisons across cultures (e.g., Deci et al. 2001). Using this procedure, we first compared the measurement components of the models across samples by constraining the loadings in one model and then comparing this against a model where the loadings were unconstrained (configural model), which is shown toward the bottom of Table 3. To interpret equivalence, we used differences in fit indices rather than changes in chi-square, as change in chi-square has been shown to be overly sensitive when large numbers of constraints are imposed (Little 1997; Marsh et al. 1988). For completeness, however, we also report change in chi-square across the models. Small differences in fit indices between models indicates equivalence across samples. While there are no precise rules, some authors cautiously offer changes of up to .010, .015, and.030

Table 3 Structural Equation Model fit indices and invariance analyses for the hypothesized model in both samples

Sample and model	χ^2	*df*	CFI	TLI	SRMR	RMSEA [90% CI]	χ^2 Δ
Australian sample							
Hypothesized model: LAS/JC → HP/OP → burn./engage	415.384***	155	.918	.900	.077	.075 [.066 – .084]	
Alternative 1: HP/OP → JC/LAS → burn./engage	457.582***	155	.908	.888	.084	.079 [.071 – .088]	42.198***
Alternative 2: LAS → JC → HP/OP → burn./engage	478.346***	157	.902	.882	.099	.081 [.073 – .090]	62.692***
Alternative 3: JC → LAS → HP/OP → burn./engage	487.459***	157	.892	.870	.109	.085 [.077 – .094]	72.075***
Alternative 4: LAS → HP/OP → JC → burn./engage	478.346***	158	.895	.875	.105	.084 [.075 – .092]	62.692***
Chinese sample							
Hypothesized model: LAS/JC → HP/OP → burn./engage	218.534***	155	.958	.949	.057	.042 [.028 – .055]	
Alternative 1: HP/OP → JC/LAS → burn./engage	231.819***	155	.949	.938	.058	.047 [.034 – .059]	13.285***
Alternative 2: LAS → JC → HP/OP → burn./engage	245.966***	157	.939	.926	.066	.050 [.038 – .062]	27.431***
Alternative 3: JC → LAS → HP/OP → burn./engage	256.995***	157	.931	.917	.067	.053 [.041 – .065]	38.460***
Alternative 4: LAS → HP/OP → JC → burn./engage	245.223***	158	.940	.928	.066	.050 [.037 – .062]	26.689***
Hypothesized model invariance analyses							
Configural model (unconstrained)	635.591***	310	.930	.915	.069	.063 [.056 – .070]	
Loadings invariant model	710.622***	330	.919	.906	.080	.066 [.059 – .073]	75.031***
Path invariant model	722.729***	335	.917	.906	.082	.066 [.060 – .073]	87.138***

χ^2 = Chi-square, *df* = degrees of freedom, CFI = comparative fit index, TLI = Tucker-Lewis index, SRMR = standardized root mean square residual, RMSEA = root mean square error of approximation, χ^2 Δ = Chi-square change, CI = confidence interval, HP = harmonious passion, OP = obsessive passion, JC = job crafting, LAS = leader autonomy support, engage. = work engagement, burn. = burnout, Configural model = unconstrained model, Loadings invariant model = all factor loadings constrained as invariant across samples, Paths invariant model = all factor loadings and all structural regression paths constrained as invariant across samples

***$p < .001$

for the CFI, RMSEA, and SRMR, respectively, as indicating equivalence (e.g., Chen 2007; Cheung and Rensvold 2002). Other studies apply more liberal change estimates of up to .050 across all indicators (e.g., Deci et al. 2001). Examining the changes in fit in our model, the data generally suggested equivalence of factor loadings across samples, with only small differences in fit observed between the two models (TLI Δ = .009, CFI Δ = .011, SRMR Δ = .011, RMSEA Δ = .003).

Having established equivalence of the factor loadings across the Australian and Chinese samples, we next examined a model in which both the loadings and structural regression paths were constrained as invariant across samples, shown in the bottom row of Table 3. Comparing this model to the model in which only factor loadings were constrained, results suggested invariance of structural regression paths, again with only small differences in fit observed between the two models (TLI Δ = .000, CFI Δ = .002, SRMR Δ = .002, RMSEA Δ = .000). Comparisons of the path-invariant model with the unconstrained configural model also showed evidence of relatively small changes (TLI Δ = .009, CFI Δ = .013, SRMR Δ = .013, RMSEA Δ = .003). Thus, we accepted the hypothesized model as the best fitting model in both countries, which is shown in Fig. 2 with invariant standardized regression coefficients.

As shown in Fig. 2, as predicted, in both samples the standardized regression coefficients show primarily significant paths ($p < .001$), including a positive bi-directional relationship between job crafting and leader autonomy support (*Australia:* .33, *China:* .44). Similarly, job crafting (*Australia:* .42, *China:* .54) and leader autonomy support (*Australia:* .35, *China:* .38), both exhibit positive directional paths with harmonious passion. Whereas job crafting was positively related to obsessive passion (*Australia:* .46, *China:* .48), leader autonomy support was negatively associated with it (*Australia:* − .17, *China:* − .14), albeit at a lower level of significance to the other paths ($p < .01$). Harmonious passion was strongly related to work engagement (*Australia:* .64, *China:* .52) and burnout (*Australia:* − .62, *China:* − .64) across both samples. By contrast, obsessive passion positively predicted burnout (*Australia:* .20, *China:* .27) and work engagement (*Australia:* .26, *China:* .25) in both samples. None of our covariates (age, weekly hours worked) showed strong direct associations with any variable in the model. The largest associations that were significant were between weekly hours worked and job crafting (*Australia:* .16, *China:* .19), which makes sense given more working hours provides more opportunity for job crafting.

Table 4 shows the indirect effects for the path-invariant model. All indirect effects were significant, with 95% CIs not encompassing zero – although the leader autonomy support to burnout and engagement via obsessive passion paths were very close to encompassing zero with small effects (− .04 each). Interestingly, indirect effects showed that when job crafting went through harmonious passion, employees experienced less burnout across cultures. However, when job crafting went through obsessive passion, employees showed higher burnout. Job crafting paths through obsessive and harmonious passion led to increases in work engagement, although increases in work engagement were stronger via harmonious passion.

Discussion

There has been a dearth of empirical research examining the motivational processes that underlie job crafting and its outcomes in the workplace. The aim of the present study was

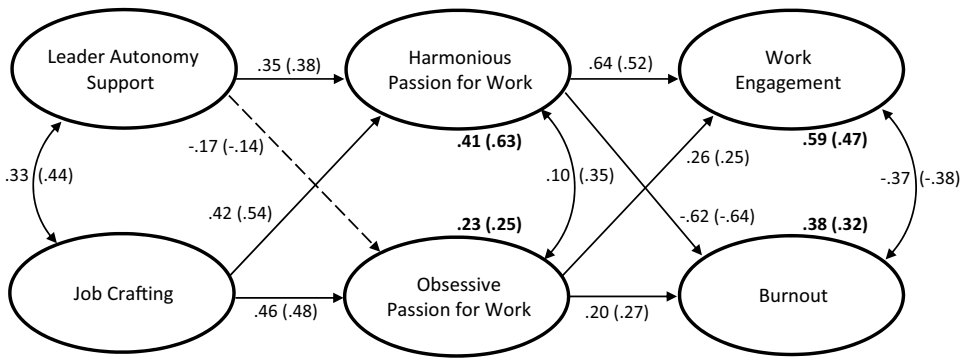

Fig. 2 Fully mediated structural equation model with standardized regression coefficients (Chinese coefficients are shown in parentheses). *R-squared* shown in bold adjacent to each endogenous latent variable. **Australia** (Final $N = 298$). χ^2 (155) = 415.384, $p < 0.001$, CFI = 0.918, TLI = 0.900, SRMR = 0.077, RMSEA = 0.075 [CI = 0.066 – 0.084]). **China** (Final $N = 228$). χ^2 (155) = 218.534, $p < 0.001$, CFI = 0.958, TLI = 0.949, SRMR = 0.057, RMSEA = 0.042 [CI = 0.028 – 0.055]). **Path invariant model** χ^2 (335) = 722.729, $p < 0.001$, CFI = 0.917, TLI = 0.906, SRMR = 0.082, RMSEA = 0.066 [CI = 0.060 – 0.073]). All directional paths shown are significant at $p < .001$ in both samples except the path between leader autonomy support and obsessive passion ($p = .010$), shown as a dashed arrow. Control variables, error variances, and factor loadings are not shown for presentation simplicity

Table 4 Standardized indirect effects for the path invariant model

Indirect effect	β	*SE*	95% CI	
			Lower	Upper
Leader autonomy support → harmonious passion → engagement	.224	.033	.160	.289
Leader autonomy support → harmonious passion → burnout	− .222	.033	− .287	− .157
Job crafting → harmonious passion → engagement	.270	.032	.207	.334
Job crafting → harmonious passion → burnout	− .267	.034	− .334	− .201
Leader autonomy support → obsessive passion → engagement	− .040	.017	− .074	− .005
Leader autonomy support → obsessive passion → burnout	− .035	.016	− .067	− .003
Job crafting → obsessive passion → engagement	.115	.029	.059	.171
Job crafting → obsessive passion → burnout	.101	.028	.047	.156

SE = standard error, CI = confidence interval

to take some steps toward addressing this gap by examining a hypothesized model whereby job crafting and leader autonomy support are related predictors that are disparately related to harmonious and obsessive passion, which, in turn, are disparately related to burnout and work engagement. We examined this model in both Australian and Chinese work contexts to test the generalizability of these relations. As predicted, the hypothesized model was supported in both the Australian and Chinese work samples, indicating that this pattern of associations is generalizable across contexts. Below, we discuss our key contributions in more detail, as well as implications of the study, strengths and limitations of our approach, and directions for future research.

Study contributions and implications

Our study takes some steps towards helping to further knowledge on the motivational processes that underlie both job crafting and leader autonomy support in the workplace. In particular, our results are consistent with the premise that job crafting can be used, and likely is used, as a way to infuse harmonious and obsessive passion into employee work identities, which was supported with our indirect effects. To the extent that job crafting behavior is driven by ego-involved motives, employees could make changes to their jobs that are focused on the attainment of maladaptive performance-goals (Kristof-Brown and Stevens 2001; Van Yperen and Orehek 2013), which are controlled in their internalization and thus consistent with obsessive passion. It is possible, for example, that employees could craft their jobs toward the attainment of objectives such as outperforming peers or avoiding failure, the upshot of which could be the advancement of obsessive passion. This finding is consistent with the postulation that job crafting is neither inherently good nor bad for employees or organizations (Wrzesniewski and Dutton 2001; Zhang and Parker 2019), but instead contains both functional and dysfunctional qualities. Research has recently shown, for example, that job crafting could yield maladaptive outcomes, including unfavorable evaluations of job proficiency and citizenship behaviors (Dierdorff and Jensen 2018) and burnout (Petrou et al. 2015; Tims et al. 2015b). We suggest that job crafting that fosters obsessive passion could be one path through which employees become burned out at work.

Job crafting is also performed with a view towards creating better alignment between individual work identities and work experiences (Slemp 2017), creating in employees a sense that the nature of the work better reflects the qualities about themselves that they deeply value and enjoy. Such a process is likely to promote a sense enjoyment and free choice about how best to pursue the work, which is consistent with harmonious passion (Liu et al. 2011). This finding supports prior work showing that when employees proactively exercise areas of strength at work, they are more likely to experience harmonious passion (Dubreuil et al. 2014), presumably because using strengths promotes the experience of authenticity (Linley et al. 2010). Indeed, job crafting is also a process through which employees can create opportunities to use strengths at work (Slemp and Vella-Brodrick 2013), which would promote harmonious passion, and likely in turn, higher engagement and lower burnout.

The pattern of associations between leader autonomy support and the two passions is more straightforward, with our results showing positive associations with harmonious passion yet negative associations with obsessive passion (see Bonneville-Roussy et al. 2013). This is consistent with the premise that the experience of autonomy support in the workplace is universally beneficial because it nurtures innate human psychological needs for autonomy, competence, and relatedness (Deci and Ryan 1987, 2000; Ryan and Deci 2017; Slemp et al. 2018, 2020). The universality postulate of self-determination theory (Chirkov et al. 2003, 2010) suggests that the relation between autonomy and desirable individual outcomes is robust beyond the West, and should be observed everywhere, irrespective of nationality or culture. Our results lend some support for this hypothesis.

We also demonstrate that the patterns of observed relations in our model are invariant across both Western and

Eastern samples. Particularly of interest in this context was whether our data would support the theoretical process that leader behavior and job crafting are reciprocally supportive. Our data are consistent with the premise that job crafting is nurtured by leaders via autonomy support, yet job crafting may also be used by employees to craft a more autonomy supportive style into their leader, thus creating an opportunity to engage in more job crafting (Berg et al. 2010; Slemp et al. 2015). The bidirectionality of this process was important to replicate in cultures where leadership dynamics differ than those from the West, and are perhaps more characterized by paternalism and formal hierarchies that may temper proactivity (Zhang et al. 2015). Thus, it appears that across both Australia and China, employees can shape leader behavior in the direction that allows more opportunities for job crafting. We suggest that this is particularly instrumental for the autonomous internalization of harmonious passion, because leaders who are less autonomy supportive might push employees towards a controlled internalization, and thus obsessive passion. This might, in turn, foster factors such as workaholism and burnout across cultural settings—which is supported by prior cross-cultural work (Burke et al. 2015; Zhao et al. 2015; Vallerand and Rahimi in press). Thus, employees could craft leader behavior towards a more autonomy supportive style that would engender the internalization of more favorable forms of passion into work identities.

Practically, our findings might offer useful insight to support the efficacy of job crafting interventions, which are becoming increasingly common (e.g., Oprea et al. 2019). First, as job crafting is a contextually embedded phenomenon (Zhang and Parker 2019), we suggest interventions should incorporate learnings about how job crafting behaviors interact with the workplace context to alter the work experience. In particular, it may be beneficial to incorporate learnings on leadership styles that are conducive to allowing more agentic behaviors like job crafting to occur, such as leader autonomy support (Slemp et al. 2015; Thun and Bakker 2018). At the same time, research shows that the work context is not fixed, but rather, is often dynamic and malleable to change (Berg et al. 2010; Johns 2006). Our research is consistent with this premise. Thus, interventions could explore strategies employees could use to initiate changes that yield more constructive leadership styles into their workplace contexts, which we suggest might enhance their efficacy in organizations. For example, Berg et al. (2010) coined the term "adaptive moves" to describe employee efforts to overcome perceived challenges to job crafting, which included efforts to change leader expectations and behaviors towards their work environment. Such behavior enabled more scope for job crafting and is a key consideration for interventions. Another consideration is about promoting productive styles of job crafting. Our findings are consistent with the notion that job crafting could be used to internalize both obsessive and harmonious passions into work identities. Accordingly, learnings about the different types of passion could be incorporated into interventions so that employees have an opportunity to explore ways to steer job crafting in more productive directions, such as towards behaviors that are more likely to promote harmonious passion and adaptive work outcomes.

Limitations and future research directions

It is important to acknowledge some limitations of the present study. First, given our design was cross-sectional in both Australia and China, it is important to note that causal inferences cannot be implied with the present data. While we indeed provide support for the sequence of variables hypothesized herein, it is possible, for example, that job crafting is also motivated by obsessive and harmonious passion, as was implied in some of our alternative models. Still, all alternative models showed poorer fit to the data and the further replication of our model presents an opportunity for future research using methods and study designs that better allow for causal inferences (see Cartwright 2010).

Second, our study contained exclusively self-report scales, which limits the study insofar as it may be affected by self-report bias (Donaldson and Grant-Vallone 2002). These two limitations also had the effect of creating common method variance in the data, which can potentially inflate mean effect sizes (Podsakoff et al. 2003).

Third, we could not examine the behaviors that specifically establish why job crafting predicts both obsessive and harmonious passion in the workplace. We propose that job crafting strategies can be enacted in both adaptive and maladaptive ways, potentially by focusing on autonomous or controlled behaviors, which we expect has different outcomes for employee mental health and should be examined in future research. While we took some steps towards establishing a positive association between job crafting and both forms of passion across cultures, given limitations with existing scales, we were not able to uncover the specific behaviors that foster each type of passion. For example, it will be important to explore specific job crafting strategies, such as those focused performance-based contingencies or out-performing peers, as possible modes through which obsessive or harmonious passion are nurtured. A notable limitation of the available job crafting measures is that they do not allow for this level of nuance, as each available measure only encompasses a narrow range of job crafting behaviors.

Fourth, we did not evaluate leader controlling behavior in the present study, which may be relevant in China given tendencies towards paternalism (Cheng et al. 2004; Zhang et al. 2015). While we determined that leader control is best captured within the concept of leader autonomy

support, as leader autonomy supportive and controlling behavior are very strongly correlated (Moreau and Mageau 2012), the incorporation of leader control presents another opportunity for future research using cross-country comparisons.

Finally, while our samples were comprised of employees within each respective country, a final limitation of our study was that the work contexts and demographics of the two samples differed. For example, it should be noted that a portion of the Australian sample was comprised of Chinese Australian employees, whereas the Chinese sample was more ethnically homogenous. It is likely that this divergence is explained by Australia's expansive immigration policies, with those from China representing the second largest group of overseas born residents, behind England (Australian Bureau of Statistics 2020). Nonetheless, it is possible these sampling characteristics explain some of our observed cross-cultural similarity in the model. Still, there is evidence to suggest that people acculturate toward the setting in which they reside (Kagitcibasi 2005; Yamada and Singelis 1999), and thus, we expect that despite the ethnicity of our samples, the self-construal of each sample is likely to be in line with the country in which they were sampled.

Conclusion

Building on the dualistic model of passion, our study shows that harmonious and obsessive passions are intervening variables between the job crafting and leader autonomy support associations with work engagement and burnout across cultures. Our results are consistent with the premise that when job crafting fosters harmonious, rather than obsessive passion, better outcomes are observed in employees (cf. Dierdorff and Jensen 2018; Wrzesniewski and Dutton, 2001; Zhang and Parker 2019). Leader autonomy support, which is malleable to change across cultures via job crafting, is more straightforward and shows universally favorable outcomes. We suggest that future research and practice should explore ways to cultivate job crafting strategies that are more consistent with harmonious passion in the workplace.

Funding This research project was funded by the Positive Psychology Research Fund of Tsinghua University, as well as a Research Development Award from the Melbourne Graduate School of Education, University of Melbourne.

Compliance with ethical standards

Conflict of interest Gavin R. Slemp, Yukun Zhao, Hanchao Hou, and Robert J. Vallerand declare that they had no conflict of interest in conducting this research.

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