Living wages across the Pacific Rim: A localised replication study from China

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Abstract

Theoretically, a living wage is a threshold that, once crossed, may transform qualities of work life, including from wage injustice to justice, organizational disengagement to commitment, and life dissatisfaction to satisfaction. Initial studies from New Zealand, South Africa and Thailand have found a threshold-like cusp in the relationship between wages and quality-of-work-life. Our aim in this study was to explore whether we would replicate a cusp in a localized study within China, among 135 employees in Shandong Province, Northern China. Survey data used minimal assumption and exploratory techniques to probe links between levels of employees’ (1) take-home wage and (2) net household income; and (3) perceived wage justice, (4) commitment to employing organization, and (5) life satisfaction. Measures were locally aligned and statistically reliable. Consistent with living wage theory, as a participant’s wage tended to cross a pay threshold of (1) RMB 4 5000 personally per month and (2) RMB 7 8000 household monthly, workers tended to report (3) wage justice (in place of injustice), (4) presence (replacing absence) of organizational commitment, and (5) satisfaction with life (replacing dissatisfaction). Our replication aim was met, but generalizing to any kind of national living wage across China would require a larger and more representative study and sample.

Keywords: poverty eradication; living wage; wage justice; organizational commitment; life satisfaction

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discrete living wage cusp, but only gradual increments in quality of living in direct proportion with wages, that is, no dramatic shifts in curve gradient. Alternatively, the dotted blue line implies that even very low wages can be positive. Any wage is a good wage compared to being unemployed, for instance (Carr et al., 2016). Third, the continuous blue line is predicting a poverty trap in the blue zone, whereby quality of (work) life as a function of income is nonlinear because employees still feel trapped below a poverty line until some living wage threshold is crossed (Kraay & McKenzie, 2014). According to this theory, only beyond a certain QoLW threshold, meaning a wage that delivers a good quality of life, beyond/to the right of the blue zone, will aspects of overall quality of life and work life such as sense of wage justice, commitment and life satisfaction simultaneously transform from generally negative (poor) to positive quality-of- (work) life ($\approx$). There are other examples of facets of overall quality of life and work life; for example, job satisfaction and life happiness (Carr et al., 2016). What they all share by definition, however, is an emphasis on the subjective experience of decent everyday living and work conditions (ILO China & Mongolia News, 2017). Thus, a living wage threshold is the monetary point that delivers a quality of living wage.

Crucially for this study, evidence has begun to emerge from an international network of scholars researching the linkages shown in Figure 1, under Project GLOW (2019). In two very different countries — South Africa and New Zealand — the best approximation to the actual survey ($N = 900$ low-income workers) data, using nonlinear regression techniques and multivariate indicators of quality of life and work life, was the dotted blue line; that is, there was a discrete wage threshold that reportedly enabled people to feel they were escaping from living poverty (Carr et al., 2018; Maleka et al., 2016). This threshold was significantly above the legal “minimum wage” paid by law to workers in the formal sector, and CoLW in those countries. Once past it, employees reported wage fairness (rather than unfairness) and, for example, being job happy rather than unhappy (Carr et al., 2019; Carr et al., 2018). Recently, similar findings have emerged from a GLOW study conducted using interview approaches with hospitality workers in Thailand (Yoelao, Mohan, & Sombatwattan, 2019).

However, these findings have so far been restricted to just three countries, raising the question of whether they are replicable elsewhere, or vary substantially, and on what basis? Nor did they include organizational commitment as a job attitude. The latter variable is very important because the Sustainable Development Goals (SDGs) stress “shared prosperity” (United Nations, 2019), including with organizational groups (Colquitt, Conlon, Wesson, Porter, & Ng, 2001; Fisher, 2010). This can occur, for example, through reciprocated wage justice in China (Farley, Earley, & Lin, 1997; Mossholder, Kemery, Bennett, & Wesołowski, 1998). Psychological research on workplace justice predicts that feeling that one is paid justly, including equitably compared to others with similar backgrounds and experience, will tend to enhance organizational commitment (Joseph, Wu, & Ho, 2012).

Organizational commitment (Allen & Meyer, 1990) is commonly factored into Affective (liking), Normative (duty) and Continuance (economic necessity). In a study of the links between wage justice and organizational commitment in India, the former predicted the latter; in particular, affective commitment (Biswas, 2015). Such findings are important for organizations, since affective commitment, like its counterpart normative commitment, is linked to performance variables such as absenteeism and turnover (Chang & Xin, 2009; Drey, Gould, & Allan, 2009), and to guanxi, meaning having good connectedness and networking in society (Chen & Francesco, 2000). This study therefore tested the relationship between wages, wage justice, and organizational commitment.

Beyond the workplace, fair pay has the potential to enhance not only quality of work life but also life-in-general, including life satisfaction (Haar, Russo, Süße, & Ollier-Malaterre, 2014). Consistent with such a possibility, an early study of the relationship between workplace pay and life satisfaction in the United States found that “a worker who is the sole supporter of a relatively large family [was] particularly sensitive to the economic attributes of his or her job” (George & Brief, 1989, p. 212). Pay was relatively salient, and predictive of job satisfaction, when hardship was higher — through lower incomes. In Mongolia, a primary trigger for stress (vs. well-being) included worries about earning insufficient income for one’s household (Chuluun, Graham, & Myanganbuu, 2016). Such findings suggest that pay and job satisfaction may be linked in nonlinear ways to life satisfaction (Figure 1). Life satisfaction in turn implies that wider household incomes will matter, too. This study probes these potential connections between wage and income with quality-of-work life and life satisfaction (Figure 1).
The principal research question in this study is therefore: Can we replicate the finding of a cusp in the relationship between wage and income on the one hand and quality of work and life on the other, in the People's Republic of China? The principal hypothesis we are testing is that there will be a nonlinear relationship with a cusp, rather than a linear relationship without a cusp. The core rationale for this hypothesis is grounded in general poverty trap theory, and in particular living wage theory (Carr et al., 2016). This predicts that only once a certain threshold is crossed will pay and income make a qualitative difference in quality of life and work life, by tending to transform both from centrally negative to positive.

To recap, the cost of living wage is the number of yuan or dollars to buy food and pay rent. A living wage delivers, in addition, a subjectively decent quality of life and work life. The minimum wage by contrast is a legal statute paid to all workers by law, in the formal sector.

Method

Participants

Drawn from urban areas of Shandong province in China’s North, 135 employees participated under conditions of informed consent and confidentiality, approved under a low-risk screening questionnaire provided by Massey University’s Human Ethics Committee. All participants were recruited by snowball. The researcher contacted relatives in China who connected with potential participants. After talking to the relatives, the researcher made sure that they understood the purpose of the study and were willing to distribute the confidential and anonymous questionnaires to their acquaintances. These consented voluntarily to take part in the research.

Demographically, respondents were female (n = 72) and male (n = 63). Modal age category was the preset response category of 41–50 years (n = 57, 42.2%), followed by 20–30 years (n = 48, 35.6%), 31–40 years (n = 20, 14.8%) and >50 years (n = 10, 7.4%). In Shandong province, the average age of employees was 30–55 years (Qian, 2014), while the mean age of our participants was 30–50 years.

Most participants came from households with three people (two working adults, one child, from China’s One-Child Policy, n = 84 participants, 62% of the sample). Next came four-person households (n = 30, 22%), then two-person households (n = 11, 8%), then five-person households (n = 7, 5%), and finally six-person households (n = 3, 2%). Families with no children ranked second (n = 35, 26%), followed by two-child families (n = 14, 10%), and finally households with three children (n = 1, <1%).

Modal number of incomes per household was two (n = 87, 64%), matching the typical Chinese family (two parents, one child). Occupationally, laborers made up the largest percentage of participants (n = 46, 34%), Teacher was next most frequent occupation (n = 33, 24%), then government officer (n = 24, 18%), then banker (n = 15, 11%), with the remaining (n = 17, 13%) participants working in diverse “other” roles.

Measures

All instruments were administered in the language of the participants, Chinese (the full questionnaire is available from corresponding author on request).

Wages

We asked respondents to report their personal monthly living wages and their annual household income in wage brackets. This can help to partially protect privacy as well as accuracy, compared to asking for precise wage and income figures (Carr et al., 2019; Carr et al., 2018). Participants were asked to choose the corresponding answer these wage questions: “What is your personal monthly income before tax and the total monthly income after tax?” “What is your household’s total annual income before tax and the total annual income after tax?”

Organizational commitment

This was measured using Wang’s 19-item Organizational Commitment Questionnaire (Wang, 2005). The questionnaire was developed from Allen and Meyer’s (1990) Commitment Questionnaire. Unlike the Allen and Meyer (1990) version, the Wang (2005) version of the questionnaire uses a 5-point Likert-type scale, ranging from 1 (strongly disagree) to 5 (strongly agree). The questionnaire adapted by Wang has a high level of reliability among Chinese employees (Wang, 2005). Through principal components analysis with orthogonal rotation, three factors of organizational commitment (affective commitment, normative commitment, and continuance commitment) from Wang’s research (2005) had acceptable alpha coefficients of reliability=.82, .89 and .92 respectively.

Wage justice

Participants’ personal perception of wage justice was measured by a combined eight-item questionnaire, including five items from Leung, Smith, Wang, and Sun (1996). This instrument measures widely accepted aspects of wage justice, adapted from Moorman et al. (1995), with modifications to render the items more appropriate for Chinese settings. Leung et al. (1996) reconstructed this scale to capture the perceived fairness of the compensation for Chinese employees. Each of their revised eight items asked participants the degree to which they were fairly rewarded on a five-item Likert-type scale. The 5-point scale ranged from strongly disagree to strongly disagree. Reliability of this measure in China (from Leung et al., 1996) for wage justice and fairness was high, with an alpha = .83, that is, the scale has shown acceptable reliability in China.

Life satisfaction

Life satisfaction was measured using Xiong and Xu’s (2009) five-item questionnaire. This was adapted from Diener, Emmons, Larsen, and Griffin’s five-item instrument called Satisfaction with Life Scale (SWLS; 1985). The items use a 7-point Likert-type scale, ranging from 1 (strongly disagree) to 7 (strongly agree). The questionnaire was originally tested by Xiong and Xu (2009) in Xinyang and Zhangqiu cities with 600 people. Cronbach’s alpha for Xiong and Xu’s (2009) questionnaire was .78, indicating that the measure would be acceptably reliable in our particular context in China.

Procedure

A key concern in this research was to keep all respondents free from mental and physical danger, so before the research was undertaken, a research proposal and measurement were peer
reviewed by a senior professor in Massey University’s People, Organization, Work and Employment Research (MPOWER) group and was recognized as low risk.

Online questionnaires and paper-and-pencil questionnaires were used to collect data. If the respondents did not have access to a computer and could not do the questionnaire online, they were given the paper-and-pencil questionnaire, which was printed and posted to their home after receiving their personal consent. In total, 49 questionnaires were completed online and 86 questionnaires were completed on paper.

In order to protect the confidentiality, privacy and anonymity of the participants, the questionnaires completed online were returned through personal email to the researcher. The paper-and-pencil questionnaires were sealed by the participants themselves and placed in an envelope that was provided by the researcher. Relatives did not open the envelope. Questionnaires were therefore anonymous. Participants who wanted to know the results of the aggregated data analysis left their personal email address on a separate piece of paper at the back of the questionnaire. This information was kept by the researcher’s relatives in China and later used to send summaries of the core findings. Paper versus online questionnaires made no significant difference to any of the variable scores (Hu, 2016).

After emailing or handing back their questionnaire, each participant was given 20 RMB. The 20 RMB was not a payment but a token of appreciation for the participants’ time.

**Results**

**Data reduction**

**Wages and income**

To preserve statistical power, we reduced our measures of these to two key variables: personal monthly wage after tax, and household annual income after tax. Personal monthly wage before tax and annual household income before tax were not used because in China, people know their actual after-tax income (Hu, 2016) and their after-tax wage and income are the actual money that employees receive from their organizations, so these are more salient for Chinese employees (Yuen, 2004).

Initially there seemed to be rather large pay ranges. Participants’ monthly take home wage ranged from <2,000 RMB (NZ$480.8) to >120,000 RMB. Annual take-home income of respondents ranged from <30,000 RMB to a high-income level of more than 300,000 RMB. However, monthly and annual incomes of <2,000 and <30,000 RMB respectively had only one participant each and were removed from further analyses. Upper tails were longer, with 12/135 (9%) individuals earning at or above 7,000 RMB monthly and 17/135 households (13%) with incomes at/above 150,000 RMB. Hence the bulk of our sample earned between 2–6,000 RMB monthly and from 30–149,000 RMB annually.

Whether the sample represented the local population was harder to address. On one hand, the mode for monthly wage was in the 3,000s RMB, not inconsistent with a mean for Shandong province of 4,318 RMB (Statistical Portal, 2014). On the other hand, for annual household income, there were two modal bands, each n = 23 (17%), of 60–69,999 and 100–119,000 RMB. These modes may partly reflect different occupational groups in our sample, or perhaps single versus double incomes per household (see Participants above). One estimate of average annual per capita pre-tax income in Shandong (during 2016) was 64,219 RMB (CEIC, 2018). Allowing for tax and annual bonuses (Hu, 2016), this would not be inconsistent with our own figures for single- and dual-income households respectively. Nevertheless, we could not claim to have a fully representative probability sample. As such, we did not seek to generalize beyond our sample (see Discussion).

**Wage justice, organizational commitment, life satisfaction**

To minimize the risk of common method variance, and to check the separability of our psychological measures, these were factor analyzed together. Because the three measures were being trialled on a relatively low-income sample, we utilized exploratory rather than confirmatory factor analysis (Carr et al., 2018).

Despite a relatively small sample size and potential low power, factorability was high (KMO = .844, Bartlett’s p < .001). After removing items that failed to load or cross-load, and using orthogonal rotation to separate factors, the factor solution in Table 1 was derived. Affective and Normative commitment could not be separated and a combined joint measure was retained. The factor solution in Table 1 explained 71% of the variance, and was clear and distinctive, with negligible factor overlap (loadings <.429 suppressed). Hence, we calculated mean scores/item for each factor in Table 1. Mean scores/item were the key dependent variables.

**Curve estimation**

Following Carr et al. (2018), to decide between linear and nonlinear models with our localised sample, we used an exploratory technique — curve estimation, in linear and cubic models — for monthly personal pay and annual household income net after tax, inclusive of bonuses, as predictors (Table 2). Criterion variables were wage justice, affective/normative commitment, continuance commitment, and life satisfaction.

Shown in Table 2, with the exception of continuance commitment as a function of monthly personal pay (p = .12, ns), for the cubic model, all of the relationships were statistically significant, despite the relatively small sample and low statistical power. This indicated that there was in general a significant relationship between income on the one hand and our criterion variables on the other (Carr et al., 2018). However, the differences in explanatory power between the linear and cubic models were too narrow to choose one over the other, that is, between linear versus nonlinear.

In order to further address our twin research questions (i.e., to decide whether the functions were linear or nonlinear, with or without any poverty trap, and the dependent variables; see Figure 1), we utilized a nonparametric technique, LOcally Estimated Scatterplot Smoothing (LOESS). This technique is apt for small samples as it does not require high statistical power (Irizarry, 2019; Jacoby, 2000). Being nonparametric, it also makes few distributional assumptions. Instead, at both lower or upper tails of a distribution (see Wages and Income, above), LOESS curve estimations are more sensitive than standard curve estimation procedures to points of inflexion and cusps — they analyze the curve in sections rather than as a whole, and can thereby detect relatively subtle changes in gradient *even in small samples* (Jacoby, 2000, p. 583). These properties combined may help offset any concerns with statistical power in smaller samples (such as ours). LOESS analysis can thereby be used to detect not only whether a relationship is linear or nonlinear, but also whether it has multiple points...
of inflexion (as in the S-shaped dotted line, a poverty trap, shown in Figure 1). For our estimations, the tension parameter was set to .50 to produce a curve that was as smooth as possible (Jacoby, 2000). Kernel function was the default in SPSS, that is, the Epanechnikov kernel.

The results are shown in Figure 2 (monthly wage left, annual household income right). As in previous research (Carr et al., 2019), our main focus was exploring the possibility of replicating the lower end of the pay spectrum sampled, not its upper tail. Independently of whether the predictor variable was personal monthly wage or monthly household income, and regardless of whether the dependent variable was wage justice, organizational commitment, or life satisfaction, the shape of the function was visually, from Figure 1, quite consistent. It was neither simply linear (straight lines in Figure 1), nor was it solely diminishing marginal returns from the base of the wage spectrum (blue line in Figure 1). The cubic model provided an approximation (dashed line in Figure 2). However, the finer-grained analysis using LOESS revealed a shape more akin to the dotted line (in Figure 1), consistently indicating a living wage threshold.

### Discussion

The major finding in this study was that we were able to replicate the preliminary findings from South Africa, New Zealand and Thailand of a living wage threshold. First, the link between wage and quality of work life was nonlinear. Second, at lower wages and incomes, quality of life and work life, for our relatively localised sample of workers in China, made no discernible difference to these criterion variables. These variables are associated in the wider literature with subjective wellbeing and organizational benefits. However, beyond the same pay and income threshold there were clear and consistent upticks on these variables. This pattern of findings thus supports previous research on living wages and is consistent with both poverty trap and living wage theories (Carr et al., 2016).

### Table 1. Factor Solution for Measures of Justice, Commitment, and Life Satisfaction

| Wage justice (α = .95) | Affective/normative (α = .88) | Life satisfaction (α = .91) | Continuance commitment (α = .84) |
|------------------------|-------------------------------|-----------------------------|---------------------------------|
| I am fairly rewarded . . | .875                          | .868                        | .863                            |
| For the stress and strains of the job | .868 | .863 | .858 |
| For the work I have done well | .840 | .840 | .837 |
| In view of my experience | .858 | .816 | .799 |
| Compared to other sectors | .840 | .816 | .799 |
| Considering my abilities | .837 | .816 | .799 |
| Compared to other workers here | .816 | .816 | .799 |
| Compared to other organizations | .799 | .816 | .799 |
| I am glad I chose to work for this company | .827 | .827 | .827 |
| Working in this organization is my best choice | .756 | .756 | .756 |
| I am familiar and feel a sense of security here | .749 | .749 | .749 |
| My own values and corporate culture are similar | .661 | .661 | .661 |
| I always tell my friends that this is an ideal place | .661 | .661 | .661 |
| As long as I can stay, I am willing to do any job | .592 | .592 | .592 |
| To enjoy benefits, people should do their duty | .587 | .587 | .587 |
| I will stay because I feel an obligation to serve | .518 | .518 | .518 |
| The conditions of my life are excellent | .884 | .884 | .884 |
| I am satisfied with my life | .849 | .849 | .849 |
| In most ways my life is close to my ideal | .819 | .819 | .819 |
| So far, I have gotten the important things I want in life | .772 | .772 | .772 |
| I won’t leave the enterprise because it gives me support | .807 | .807 | .807 |
| I will stay in the organization because I cannot find any good jobs | .768 | .768 | .768 |
| I will lose many benefits if I quit the organization | .760 | .760 | .760 |

| Eigenvalue | 6.2 | 4.3 | 3.3 | 2.5 |
| Percentage variance | 27 | 19 | 14 | 11 |
Was there a living wage threshold (as depicted by the dotted line in Figure 1)? From Figure 2, yes, there was. The LOESS curves largely began with a relatively flat section of curve, suggestive of a poverty trap (Carr et al., 2016). Thereafter, the curves visibly rose relatively sharply, reaching mini-peaks once monthly personal wage reached 4–5,000 RMB monthly personal wage, and household annual income midway between 80Ks and 90Ks, that is, an average of 90K RMB per annum approximately, or, divided by 12, 75K RMB per month — that is, almost double the personal monthly wage. Crucially, this monetary threshold on the x-axis corresponded with crossing the neutral point on the dependent variables (i.e., on the y-axis) from wage injustice to justice, lack of commitment to commitment, and life dissatisfaction to satisfaction. Thus, at a relatively localized level inside China, we replicated previous international findings of a cusp.

Second, we asked on what dependent variables was the living wage manifested. On all of the dependent variables in Table 2, there was a visible mini-peak for all of the variables measured, spanning personal monthly wage and annual household income; as well as wage justice, organizational commitment, and life satisfaction. The peaks and troughs visible in Figure 2, though, were also more discernibly flat at the beginning and somewhat more visibly cusped thereafter for personal wage as compared to household income. This indicated that the poverty trap was more salient for participants at an individual level than at the level of household unit. In retrospect, we might have expected individual wage to be more salient for individuals than household income, a group-level variable (Ajzen, 2011). The finding was at least consistent with recent research from New Zealand, which found that household income acted as a buffer for individual wage, moderating statistically significant linkages between the latter and individual job attitudes (Carr et al., 2019).

Like the addition of household incomes, the inclusion of organizational commitment in the current study’s list of dependent variables implies and recognizes the importance of building shared prosperity (United Nations, 2019). This inclusion of organizational commitment as a dependent variable was a novel, if tentative, contribution to the literature.

Since our study was conducted, others have also calculated a living wage figure in China. A largely cost-of-living-based estimation of a living wage in urban Shanghai during 2015–16 (when our data too were collected; Hu, 2016) was a monthly personal wage of 4,136 RMB. This was based on an urban household of 3.5 people, and 1.78 workers (Global Living Wage Coalition, 2015). The figure included mandatory deductions such as tax. Recalibrating to a living wage net of mandatory deductions (as in our data, via tax), the figure that is comparable to ours would be RMB 3,702 monthly. This estimate is lower than our estimate of 4.5K monthly personal wage (net, after tax). To that extent, any largely costs of living wage estimates of a living wage (CoLW, in Figure 1) may not fully capture subjective quality of living (QoLW, Figure 1).

The overarching aim of this study was not generalization but replication, at a relatively localized level (Gergen, 1973). Of course, this initial study of living wages in the People’s Republic of China has many ways in which it could be improved, and extended. Most obviously, a larger and likely more representative probability sample, the inclusion of time as a key variable to enable inferences about causation in addition to association, and the expansion of measures to include actual performance and evaluation of living wage interventions would all expand the focus, relevance, and applied impact of the research. A larger sample would also power the confidence required for tests of mediation; for example, of links between wage and life satisfaction by sense of wage justice (Fiske, Kenny, & Taylor, 1982). Such developments are in fact already planned and underway as part of the interdisciplinary, international, intergenerational and longitudinal study of living wages in Project GLOW, which ultimately aims to provide reliable, representative and replicable evidence on the psychology of living wages and decent work under the SDGs (http://projectglow.net).

### Table 2. Fit Statistics for Curve Estimations

| Function | Dependent variable: Wage justice | | | Dependent variable: Affective/normative commitment | | | Dependent variable: Continuance commitment | | | Dependent variable: Life satisfaction |
|----------|----------------------------------|---|---|----------------------------------|---|---|----------------------------------|---|---|
| Linear   | 14.83**** .10                    | | | 8.18*** .06                    | | | 5.12* .04                    | | | 12.03*** .08                    | |
| Cubic    | 4.98*** .10                      | | | 4.54*** .10                    | | | 5.23*** .10                    | | | 20.11**** .13                    | |
| Linear   | 5.12* .04                        | | | 1.98 .04                       | | | 5.12* .04                        | | | 12.87**** .09                    | |
| Cubic    | 4.03*** .09                       | | | 4.98*** .10                    | | | 4.85*** .10                       | | | 4.85*** .10                       |

Note: *p < .05, **p < .01, ***p < .005, ****p < .001
Monthly df = 1,132 (linear), 3,130 (cubic); Annual df = 3,131 (linear), 3,129 (cubic).

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Figure 2. Wage justice, organizational commitment, life satisfaction as functions of monthly personal wage after tax (monthlyafter), and annual household income after tax (annualafter).

x-axis: 2 = 2–2,999 RMB, 3 = 3–3,999, 4 = 4–4,999 RMB, and so forth

2 = 30Ks, 3 = 40Ks, 4 = 50Ks, 5 = 60Ks, 6 = 70Ks, 7 = 80Ks, 8 = 90Ks

y-axis: 5-point scale ranging from strongly disagree (1) to strongly agree (5), 3 = undecided, 7-point scale added slightly (dis)agree, neutral = 4.
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