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Multi-track pension system and life satisfaction of urban elders in China

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Abstract

There exist three pension systems for urban older residents in China: the pension for government and public institutions (PGPI), the worker's old-age insurance for enterprise employees (WOI) and the urban residents' social pension insurance (URSPI). This study examines how this multi-track pension system relates to older urbanites' life satisfaction. The ordered logistic regression model was fitted to analyse the urban sample of the China Longitudinal Ageing Social Survey (60+ years), a nationwide representative survey collected in 2014. The mediation analyses were further adopted to investigate the potential formative mechanisms. A significantly higher level of life satisfaction was detected for those who receive PGPI benefits relative to those who have access to URSPI and WOI, but no significant difference is detected between URSPI and WOI. Further analyses suggest that the advantage of PGPI in terms of life satisfaction is mediated not through monetary resources, but through the dispositional factor of perceived self-value for the society. This study suggests that different institutional configurations of the pension system stratify older urbanites' subjective wellbeing by virtue of factors that are associated with people's capabilities of acting and functioning.

Keywords: multi-track pension system; life satisfaction; urban China

Introduction

The rapid ageing of Chinese society extraordinarily expands the population of senior citizens. According to the statistical bulletin released by the National Bureau of Statistics (2017), by the end of 2016, the number of citizens who were aged 60 or above was more than 230 million, making up 16.7 per cent of the total population. Given the currently limited social resources for elder-care and the demise of the traditional kin-based support model (Hu, 2017; Hu and Chen, 2019a, 2019b; Hu and Tian, 2018), a great many older adults in China have to rely on themselves to maintain their status of wellbeing (Chen and Powell, 2012). For urban residents, in particular, the pension benefits, as in many other societies, is the critical or even only support that helps to sustain a decent standard of life (Feng *et al.*, 2011).

One interesting feature of the pension system in urban China is the 'multi-track' structure (Cai and Cheng, 2014; Zheng, 2015). Specifically, three tracks are witnessed. One is the pension for government and public institutions (機關事業單位離退休金; PGPI), one is the worker's old-age insurance for enterprise employees (城鎮職工基本養老金; WOI) and the third is the urban residents' social pension insurance (城鎮居民社會養老保險; URSPI) for urban non-employees. Due to different institutional configurations, these three pension schemes can be distinguished sharply from each other in terms of the amount of pension benefits, coverage rate, adjustment mechanisms and stability (more discussions are presented below). Against this background, we want to investigate the following question:

- How does the multi-track pension system relate to the perceived life satisfaction of older residents in urban China?

To the best of our knowledge, this study represents the first attempt to look into the implications of all three types of pension schemes in urban China for older people's subjective wellbeing, which makes contributions to the current scholarship on the disparities of the subjective aspect of life quality by highlighting the role of unique institutional arrangements. In light of the fact that most of the older urbanites are subject to one particular type of the three examined pension systems in contemporary China, the findings of this article better our understanding of the determinants of older people's life satisfaction in a rapidly ageing society. For instance, the results of this study are enlightening for the consequences of the current pension reform in China by informing how older adults' life satisfaction in urban China would be influenced if the multiple-track pension system, especially the difference between PGPI and WOI, is terminated.[1]

Additionally, when examining the formative mechanisms of the nexus between pension schemes and the perceived level of life satisfaction, we supplement the conventional resource-centred perspective – the approach that focuses on the rift in pension benefits and ensuing gap in purchasing capacities (*e.g.* Feng *et al.*, 2011) – by bringing the dispositional mediator to the forefront. This is driven by the fact that the inter-pension scheme differences lie not only in the amount of pension benefits, but also in the extent of pension continuity, security and certainty. The latter difference, according to existing research (Mansvelt *et al.*, 2014), can be strongly related to older individual's autonomy, competence and self-efficacy (Deci and Ryan, 2000), which are further correlated with the perception of life quality.

In the subsequent section, we will be providing an overview of the characteristics of the multi-track pension system in urban China,[2] which is followed by our hypotheses and discussions on potential mediators. After presenting methodological details, we will show the major empirical results and conclusions.

The multi-track pension system in urban China: an overview

Among the three pension schemes in urban China, URSPI is newly installed, in 2012, while PGPI and WOI have a long history that can be traced back to the socialist era. Moreover, PGPI and WOI are more comparable with each other because they both concern employees. In light of these distinctions, we first

introduce and compare PGPI and WOI, followed by the description of the basic characteristics of URSPI.

In urban China, a formal pension system was launched in the 1950s (1951 for state-owned enterprises and 1955 for civil servants and public institution employees). As part of the comprehensive work unit system,[3] this pension scheme for public institutions was *non-contributory, but with defined benefit* (Wu, 2013; Dong and Wang, 2016): it was funded entirely from the government budget, and the pension benefits depended on the pensioners' salaries during their working years. At this point, there was no WOI or URSPI.

The distinction between PGPI and WOI was established in the late 1980s and the 1990s, when China started to transit from the central planning economy to the market-oriented economy (Dong and Wang, 2016). One reform measure of this wave of marketisation is to establish a unified pension scheme for enterprises of different ownerships. After some pilot projects, an old-age insurance was formally implemented by the State Council in 1997. In this study, we follow the national standard of social insurance terminology and call it WOI. According to WOI, the pension scheme is *contributory*, consisting of a mandatory pay-as-you-go basic pension, a mandatory contribution from employees' personal account and a voluntary enterprise-based pension (Chow and Xu, 2003). Enterprise employees can receive pension benefit only after making 10–15 years' contribution, and the level of pension benefits is determined not by the salaries before retirement, but by the city-specific average salaries before one retires.

Relative to these initiatives for enterprises, however, the pension scheme for government and public institutions, that is, PGPI, was largely untouched in the wave of reform in the late 1980s and the 1990s. It preserves the non-contributory defined-benefit model. Being still fully subsidised by the government budget, the employees of government and public institutions can receive pension benefits after retirement, with the level of benefits to be based on the pensioner's previous salaries. This pension scheme, clearly, constitutes an arresting contrast with that of WOI (Zheng, 2015).

Specifically, the foremost contrast between PGPI and WOI concerns the level of pension benefits. As discussed above, the pension benefits are computed based on the pre-retirement salaries for PGPI, but on the pre-retirement city-level average salaries for WOI. Since salaries of public-sector employees are usually higher than the average level, the pension benefits of PGPI are accordingly higher than those of WOI. For instance, the monthly pension benefits for enterprise retirees, public institution retirees and government retirees were 455, 634 and 656 Yuan, respectively, in 1998. The extent of disparity deteriorated to be 734, 1,369 and 1,534 Yuan, respectively, in 2005 (Zhang, 2012).[4] This pension benefit disparity suggests a considerable gap of replacement rate between PGPI and WOI. For PGPI, the replacement rate is usually over 80 per cent, but that for WOI, according to the report released by the government, was only around 67 per cent in 2014.[5]

In addition to pension benefits, the two tracks of pension schemes also differ greatly in the extent of pension security and stability, where PGPI is undoubtedly much more advantaged than WOI. Indeed, the pension for public employees is fully funded from the government budget, so the employers barely have financial pressures. Also, because of the publicity nature, the employers are more likely to

abide by the legal requirements that protect the welfare of employees (Wu, 2013). Compared with public institutions, it is not uncommon for enterprises to try to avoid paying for employees' pensions, despite such contributions from enterprises being required by law. This is due partly to the cost-saving consideration and partly to the precarious economic situation of enterprises in the market. As a result, it comes as no surprise that the coverage rate differs greatly between PGPI and WOI, where the coverage rate of PGPI can be 100 per cent, while that for WOI is lower than 50 per cent (Salditt *et al.*, 2008; Zhang, 2012).

The disparities in pension stability are also embodied by the pension adjustment mechanism (*e.g.* Guo, 2008; Cai and Cheng, 2014). According to current practices, the adjustment of pension benefits of PGPI is made on the basis of the salary growth rate of the currently employed, while the pension adjustment method of WOI is to increase pension income by a certain percentage of the monthly average pension income of all enterprise retirees.[6] Understandably, the average pension income is lower than the average salaries of the currently employed, so the adjustment *de facto* enlarges the gap of pension benefits between PGPI and WOI (Zheng, 2015).

In addition to PGPI and WOI, a third type of pension scheme that was launched in urban areas in 2012 is URSPI. Unlike PGPI and WOI, URSPI is the insurance programme for non-employees in urban areas who are 16 years old and over. URSPI is composed of individual contributions and government subsidies. The level of individual contributions, as voluntarily chosen by the pensioners, varies from 100 to 2,000 Yuan per year. Pension benefits of URSPI consist of two parts. One part refers to the basic pension, which is 55 Yuan per month. The other part depends on the savings amount of the personal account, and the monthly pay is the total savings amount divided by 139. Clearly, the pension benefits from URSPI are rather limited, much less than that of either WOI or PGPI. However, due to the partial support from the government, URSPI is a rather stable type of old-age insurance.

In summary, there are three types of pension schemes in urban China which provide differential extents of support for pensioners, which have great implications for older people's subjective wellbeing, as discussed in the following section.[7]

Hypothesis and mediators

Based on the discussions in the previous section, the differences in the three pension schemes imply disparities in terms of both the amount of pension benefits and the extent of security. In this regard, there are good reasons to expect the relative (dis)advantages of pension schemes can be convertible to some form of stratification of pensioners' life satisfaction. Among these three types of pension, PGPI is undoubtedly advantaged over the other two, and URSPI, due to its limited support, could be inferior compared with WOI. Hence, we hypothesise:

- Hypothesis 1: Other things being equal, the average level of life satisfaction is highest among the pensioners of PGPI, followed by those of WOI, and lowest among the pensioners of URSPI.

If this hypothesis holds, the next research question would concern the potential mediators between pension schemes and life satisfaction. Two mediators are examined in this study. The first mediator is the monetary pension income. In light of the strong reliance on pension income for maintaining wellbeing among urban older residents, we suspect that the disparities in pension benefits by pension schemes serve to bridge pension scheme type and stratification of life satisfaction.

- Hypothesis 2: The differential monetary pension benefits are a mediator between pension schemes and life satisfaction.

Arguably, Hypothesis 2 follows a resource-centred perspective that approaches the inequality of subjective wellbeing of older urbanites by setting focus on the differential amount of accessible resources. However, the three pension schemes distinguish from each other in terms of not only monetary resources, but also the extent of stability and certainty. In this regard, previous studies have shown that a stable income source, not the amount of income *per se*, can be an important mechanism to nurture self-efficacy – a kind of optimistic belief in 'causality, agency, or control' (Gecas, 1989: 293). Self-efficacy subsequently serves as a desirable disposition that gives rise to the status of life satisfaction by increasing one's sense of competence and autonomy (Deci and Ryan, 2000). Altogether, we propose the following hypothesis:

- Hypothesis 3: The differential of self-efficacy is a mediator between pension schemes and life satisfaction.

It is necessary to mention that self-efficacy stands for a different construct from life satisfaction, where the former emphasises individuals' agency, mastery and control, while the latter concerns an overall evaluation and judgement of life status.

Research design and methods

Sample

In this study, we take advantage of the urban sample from the China Longitudinal Ageing Social Survey (CLASS) that was collected in 2014. As the nationally representative data, the CLASS adopted the multi-level sampling strategy, where the primary sampling unit was county and the secondary sampling unit was neighbourhood committee in urban areas. Within each neighbourhood committee, a map-based sampling approach was used, where every building in the neighbourhood committee was marked out and all households located in these buildings were included. These households constituted the local sampling frame. This strategy helps to improve sample representativeness because the official household registration information was usually incomplete.

In total, the CLASS surveyed 6,907 urban residents who were 60 years old and over in 2014. Among them, 5,005 receive at least one pension scheme among PGPI, WOI and URSPI, so they constitute the final analytical sample for this article. It is worth mentioning that population mobilisation should not affect our urban-based

analysis. For one thing, the transfer of pension benefits across cities is still difficult, although it was allowed in 2010. For another thing, senior individuals are more reluctant and less capable of migrating permanently. For example, in the CLASS, only 2.65 per cent of the older respondents obtained the local household registration status after 60 years old. Whether excluding them or not does not substantively change our conclusions.

Measures

The outcome of interest is life satisfaction, which, following previous literature (*e.g.* Mahoney *et al.*, 2016), is measured by the question 'In general, are you satisfied with your life?' The options are 1 = very unsatisfied, 2 = unsatisfied, 3 = neutral, 4 = satisfied and 5 = very satisfied. Because our research objective is to compare the tracks of pension schemes, the predictor pension scheme has three options, with 0 = WOI, 1 = URSPI and 2 = PGPI. In terms of the potential mediators, the monetary pension benefits are measured by the monthly pension income. To enhance interpretation, this variable is log-transformed. In addition to this mediator, the dispositional mediator is gauged by the perceived self-value for the society, as measured by the extent of agreement with the statement 'I am still a valuable person in the current society'; the options are 1 = entirely disagree, 2 = disagree, 3 = neutral, 4 = agree and 5 = entirely agree. This question captures one's self-evaluation insofar as it indicates an individual's self-mastery (Gecas, 1989).

Control variables in this study include gender (1 = female, 0 = male), age, age squared, educational attainment (1 = illiterate, 2 = basic literacy class, 3 = preliminary school, 4 = junior middle school, 5 = senior middle school, 6 = associate degree and above), household registration status (1 = agricultural, 0 = non-agricultural), marital status (1 = married, 0 = otherwise), co-residing with a son (1 = yes, 0 = no), co-residing with a daughter (1 = yes, 0 = no), co-residing with the spouse (1 = yes, 0 = no),[8] number of sons, number of daughters, chronic disease, physical activity hardship, negative life events, log-transformed annual income, number of apartments one owns and the type of work unit before retirement (1 = government and Communist Party institutions, 2 = enterprises, 3 = public institutions, 4 = social groups, 5 = without explicit work unit, 6 = self-employment, 7 = military services, 8 = others).

Some of these control variables are generated based on the combination of multiple items. Chronic disease is measured by the number of diseases the surveyed individuals ever had from the following list: hypertension, heart disease/coronary heart disease, diabetes, cerebrovascular disease (including stroke), kidney disease, liver disease, tuberculosis, rheumatoid, cervical/lumbar disease, arthritis, breast disease, reproductive diseases, prostate disease, urinary system diseases, glaucoma/cataract, cancer/malignancy, Alzheimer's disease, osteoporosis, chronic bronchitis/other respiratory diseases, neurological diseases, gastroenteritis or other digestive diseases, Parkinson's disease and deafness. Physical activity hardship is measured by the single factor generated from the following items: 'Can you clean up and tidy yourself (*e.g.* hair, shaving, make-up, *etc.*)?', 'Can you wear your own clothes?', 'Can you bathe yourself (shower or bath)?', 'Can you eat for yourself?', 'Can you take medicine yourself?', 'Can you go to the toilet yourself?', 'Can you

move from bed to bedside chair yourself?', 'Can you walk indoors?', 'Can you go up and down the stairs?', 'During the past 12 months, have you ever fallen?', 'Can you walk outside?', 'Can you use public transportation (such as buses) by yourself?', 'Can you shop yourself?', 'Can you manage your own money?', 'Can you lift up five kilograms of weight?', 'Can you cook for yourself?' and 'Can you do housework yourself?' Options to these items are 1 = can do it independently, 2 = need some help and 3 = cannot do it at all (for the question about having a fall, the options are 1 = never, 2 = once and 3 = at least two times; for the questions about money management and weight lifting, the options are 0 = can do it and 1 = cannot do it). This single factor explains 56 per cent of the variance and Cronbach's alpha is 0.93 (more information is available in Table A1 in the Appendix).[9] Finally, negative life events is the total number of the following events that were experienced by the respondent over the past 12 months: heavy disease, natural disaster, death of the spouse, death of children, death of relatives, financial loss, serious disease of family members, conflict with relatives or friends, moving and accident.

We take into account a wide set of control variables in order to examine the net association between pension track and life satisfaction, but still, there can be relevant covariates which were not measured in CLASS, such as the quality of employment, personality and perceived discrimination. In order to see how these omitted variables might bias our conclusions, we conducted the sensitivity analysis using the method proposed by Carnegie *et al.* (2016). In the sensitivity analysis, an unobserved variable U was simulated in terms of its correlation with life satisfaction (denoted by ζ^y) and correlation with pension scheme (denoted by ζ^z). What we see is how our analytical result changes by manipulation the values of ζ^y and ζ^z. Robustness to the omitted variable problem can be confirmed if the combination of ζ^y and ζ^z has to reach a large value to reduce the coefficient of interest to zero. That is to say, if U has to be strongly related to both the predictor and the outcome to nullify the coefficient, U itself is unlikely to exist, so that the estimated coefficient is robust. More details are in the Note of Figure A1 in the Appendix. The result suggests that our study is generally robust to the omitted-variable problem.

Descriptive information of the variables are in Table A2 in the Appendix.

Method

Given the ordered categorical nature of the dependent variable, we use the ordered logistic regression model to examine the relationship between the type of pension one is subject to and the level of life satisfaction, net of the other control variables.

Following the ordered logistic regression model, we conducted the mediation analysis using the method proposed by Karlson *et al.* (2012) (Karlson, Holm and Breen method (KHB)). One merit of the KHB method is to circumvent the heterogeneous error-variance problem in coefficient comparison between generalised linear models (Mood, 2010). To see this, a latent continuous measure of life satisfaction is denoted by LS* and two models are fitted, as follows:

$$\text{LS}^* = \alpha_F + \beta_F \text{Pension scheme} + \gamma_F \text{Mediator} + \delta_F \text{Covariates} + \epsilon_1. \quad \text{(Model 1)}$$

$$\text{LS}^* = \alpha_R + \beta_R \text{Pension scheme} + \delta_R \text{Covariates} + \epsilon_2. \quad \text{(Model 2)}$$

Model 1 is the full model and Model 2 is the reduced model, as noted by the subscripts 'F' and 'R', respectively. If Models 1 and 2 are the ordinary least-squares (OLS), the mediation effect of the mediator would be captured by the difference between β_R and β_F, that is, the change of coefficient before and after taking into account the mediator (MacKinnon *et al.*, 2007). However, this approach cannot be used for the generalised linear model due to the heterogeneous error-variance problem. Specifically, the latent variable LS* is unobservable, but measured with an ordered categorical variable (the observed variable of life satisfaction). In this case, the estimated coefficients – denoted respectively by b_R and b_F – are the ratio of the real coefficients and the variance of the error terms (denoted respectively by σ_R and σ_F), as in

$$b_R = \frac{\beta_R}{\sigma_R} \text{ and } b_F = \frac{\beta_F}{\sigma_F}.$$

Therefore, direct comparison between b_R and b_F is inappropriate since σ_R is usually not equal to σ_F.

To resolve this problem, the KHB method starts from regressing the mediator on the predictor and covariates, and then uses the model residual instead of the original observed measure to fit Model 1, as in Model 3:

$$\text{LS*} = \tilde{\alpha}_R + \tilde{\beta}_R \text{Pension scheme} + \tilde{\gamma}_R \text{Mediator}_{\text{residual}} + \tilde{\delta}_R \text{Covariates} + \epsilon_3.$$

(Model 3)

The variances of ϵ_3 and ϵ_1 are equivalent (*i.e.* denote the variance of ϵ_3 to be $\tilde{\sigma}_R$, so that $\tilde{\sigma}_R$ σ_F). Also, $\tilde{\beta}_R = \beta_R$. Hence, we have

$$\tilde{b}_R - b_F = \frac{\tilde{\beta}_R}{\tilde{\sigma}_R} - \frac{\beta_F}{\sigma_F} = \frac{\beta_R - \beta_F}{\sigma_F} = \frac{\gamma_F}{\sigma_F} b$$

A test statistic for the null hypothesis of $\tilde{b}_R - b_F = 0$ can be constructed using the delta method, and we have

$$\sqrt{N}(\tilde{b}_R - b_F) / \sqrt{\left(\frac{\gamma_F}{\sigma_F}, b\right) \Sigma \left(\frac{\gamma_F}{\sigma_F}, b\right)'} \sim N(0, \ 1),$$

where Σ is the covariance matrix for γ_F and b. If the test statistic is significant, the mediation effect exists. In this study, the estimation of $\tilde{b}_R$ and b_F is based on the ordered logistic regression model.

Missing data were handled using multiple imputation, but note that the substantive conclusions do not change before and after imputation.
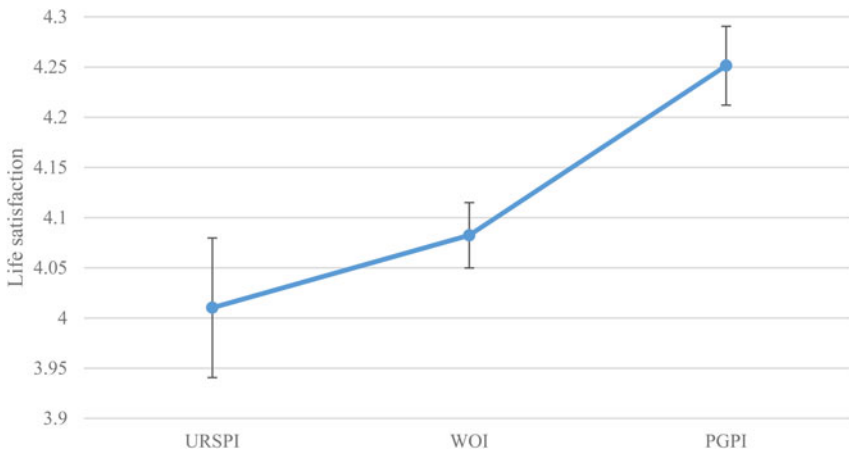
Figure 1. Disparities in life satisfaction by pension scheme.
Notes: Average value of life satisfaction with the 95 per cent confidence interval. URSPI: urban residents' social pension insurance. WOI: worker's old-age insurance. PGPI: pension for government and public institutions.

Results

Descriptive pattern

To get an intuitive idea about the nexus between pension scheme and life satisfaction, we describe the average value of life satisfaction across the three pension tracks in Figure 1. It is evident that the reported life satisfaction of those who receive PGPI benefits is on average higher than that of people who receive WOI or URSPI benefits. Based on the distant 95 per cent confidence intervals, this difference is statistically significant. However, the considerable overlap of the 95 per cent confidence intervals between WOI and URSPI shows that the extent of subjective wellbeing of people receiving these two types of pension does not differ from each other significantly.

In general, this pattern lends support to the notable advantages of PGPI for older urbanites' life satisfaction in relation to the other two types of pension schemes.

Multivariate analysis

In this sub-section, we fitted the ordered logistic regression model, controlling for a wide set of covariates. The result is shown in Table 1. On average, those who receive PGPI benefits have 28 per cent ($\exp^{0.245} - 1$) higher odds of reporting a better status of life satisfaction than those who have WOI benefits (the reference option), but again, the distinction between WOI and URSPI is not statistically significant at the conventional 0.05 level.[10] This multivariate finding echoes the descriptive pattern and highlights the stratification of subjective wellbeing across pension tracks in urban China.[11]

The mediation analyses

The next question we investigate is the mechanism through which pension tracks are linked with one's life satisfaction. The results of the mediation analyses concerning the PGPI *versus* WOI distinction are presented in Table 2.

Table 1. Results of the ordered logistic regression model on the association between pension scheme and life satisfaction

	Non-standardised coefficient	SE	p
Pension scheme (Ref. WOI):			
URSPI	−0.035	0.158	
PGPI	0.245	0.087	**
Gender (female)	0.200	0.071	**
Age	0.019	0.075	
Age squared	0.000	0.001	
Educational attainment (Ref. Illiterate):			
Basic literacy class	0.478	0.289	
Preliminary school	0.033	0.147	
Junior middle school	0.056	0.149	
Senior middle school	0.026	0.155	
Associate degree and above	−0.083	0.169	
Household registration status (agricultural)	−0.120	0.177	
Marital status (married)	0.079	0.197	
Co-residing with a son (yes)	−0.192	0.079	*
Co-residing with a daughter (yes)	−0.153	0.102	
Co-residing with the spouse (yes)	−0.046	0.188	
Number of sons	0.109	0.045	*
Number of daughters	0.192	0.038	***
Negative life events	−0.211	0.064	***
Number of owned apartments	0.100	0.066	
Log-transformed annual income	0.077	0.061	
Work unit type (Ref. Government and Communist Party institutions):			
Enterprises	−0.281	0.150	
Public institutions	−0.046	0.142	
Social groups	0.424	0.423	
Without explicit work unit	0.177	0.477	
Self-employment	−0.275	0.297	
Military services	0.064	0.472	
Others	−0.610	0.317	

(*Continued*)

Table 1. (*Continued.*)

	Non-standardised coefficient	SE	p
Chronic diseases	−0.410	0.076	***
Physical activity hardship	−0.351	0.045	***
/cut1	−2.652	2.781	
/cut2	−1.196	2.775	
/cut3	0.799	2.774	
/cut4	2.850	2.775	
Likelihood ratio χ^2	255.450		***

Notes: N = 4,341. SE: standard error. Ref. reference category. URSPI: the urban residents' social pension insurance. WOI: the worker's old-age insurance. PGPI: pension for government and public institutions. Cut1 through Cut 4 refer to the cut points of the latent dependent variable in the ordered logistic regression model.
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests).

The log-transformed pension benefits do not play a significant mediating role. This finding challenges the resource-based approach, and responds to most previous studies on the pension system in urban China where scholars emphasise the potential socio-economic disparities by pension track. To check the robustness of this finding further, we re-performed the mediation analysis among those whose sole income is the pension income. Again, no significant mediating effect is found. Taken together, the pension scheme difference between PGPI and WOI does not affect retirees' subjective wellbeing via the channel of socio-economic conditions.

Relative to this insignificant finding for the monetary factor, the mediating analyses show that those who receive PGPI benefits, relative to WOI pensioners, report a higher level of life satisfaction by virtue of viewing themselves to be more valuable to the society. In this regard, it seems that the link between pension system distinction and life satisfaction is established through the *non-economic* dispositional factor.

One concern for the distinction between WOI and PGPI is that, for those who retired early, the comparison between PGPI and WOI makes little sense because their distinction did not come into play until in the 1990s. To check whether or not this concern biases our conclusions, we re-conducted the mediation analyses by focusing on the sub-sample of urban residents who retired after 1990. Similar results were obtained, as shown in Table 2, which supports the robustness of our analyses.

It is worth mentioning that the distinction between PGPI and URSPI shows a similar pattern, where it is not economic resource but the *non-economic* dispositional factor that plays a significant mediating role (mediation coefficient = 0.054; $p = 0.026$).

Concluding remarks

This study examines the implications of the multi-track pension system in urban China for the life satisfaction of older residents. By analysing the urban sample

Table 2. Results of the Karlson, Holm and Breen (KHB) mediation analyses

	All sample cases			Retirement timing after 1990		
	Non-standardised coefficient	SE	p	Non-standardised coefficient	SE	p
Log-transformed pension benefits:						
Reduced	0.421	0.061	***	0.415	0.065	***
Full	0.417	0.061	***	0.411	0.065	***
Difference	0.004	0.003		0.004	0.003	
Log-transformed pension benefits (pension benefits as the only income):						
Reduced	0.305	0.127	*	0.299	0.135	*
Full	0.313	0.127	*	0.303	0.135	*
Difference	−0.008	0.008		−0.003	0.008	
Self-reported value for the society:						
Reduced	0.413	0.062	***	0.408	0.066	***
Full	0.386	0.062	***	0.381	0.066	***
Difference	0.027	0.009	**	0.027	0.010	**

Notes: SE: standard error. Control variables include gender, age, age squared, educational attainment, household registration status, marital status, co-residing with at least one son, co-residing with at least one daughter, co-residing with the spouse, number of sons, number of daughters, negative life events, number of owned apartments, log-transformed annual income, work unit type, chronic diseases and physical activity hardship.
Significance levels: * $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$ (two-tailed tests).

of CLASS 2014, we find a significantly higher level of life satisfaction among those receiving PGPI benefits relative to those who have access to the pension benefits of WOI or URSPI. Further analyses suggest that this association is mediated not through the resource-based factor such as the amount of pension benefits, but through the non-material dispositional factor of perceived self-value for the society.

Following the resource-centred line of thinking, previous studies examine the pension system in urban China by setting focus on the disparities in material and economic resources. This study, however, suggests that monetary disparities driven by pension scheme difference is not so critical for older people's psychological wellbeing. What matters are dispositional factors related to the institutionally stratified pension stability and security, which is a non-monetary social force that affects the extent to which older adults have confidence in their everyday existence, live a socially meaningful life and possess the ability to cope with the unpredictability of everyday life. In a sense, this is especially important for societies like China, where shrinking family support and limited public support are insufficient to compensate for the wide range of challenges of ageing that negatively affect their sense of security, *e.g.* the decline of health status, change in intergenerational relations, dwindling social networks and so forth.

Theoretically, the highlighted non-material stratification across pension tracks responds to the capability approach of Sen (1999). According to this theoretical approach, an institutional system that is designed for maintaining and promoting people's wellbeing is not a straightforward function of resource possession, but depends more on whether or not this system enables people to act or function. One important enabling and functioning factor, in this regard, is self-perception of individual values that is examined in this study. In this case, the pension scheme distinction relates to the disparity of individual capabilities in Sen's sense, and this disparity subsequently stratifies older people's life satisfaction.

Some limitations of this study should be acknowledged. The cross-sectional design of CLASS determines that the detected relationship between pension scheme and life satisfaction, strictly speaking, is correlational instead of causal (Hu and Mustillo, 2016). To ascertain a causal link, more data are needed. For instance, more could be learned if longitudinal data exist to allow us to look at people before and after pension coverage begins, and look at the related changes in life satisfaction between those two periods. Also, the measures of the key variables can be refined. For instance, a more nuanced distinction between civil servants and public institution employees can reveal the subtle variations within the public sector. More importantly, more background variables related to employment history are needed to show the net link between pension scheme and subjective wellbeing.

With that said, this study, for the first time, explores the socio-psychological consequences of the multi-track pension system in urban China. Our findings, although being based on the case of one country, contribute to a broader argument about the (in)adequacies of private welfare systems to function as equivalents to public welfare systems, thus being enlightening for scholars and policy makers of other societies.

Notes

1 Over the past few years, some pilot reforms have been conducted attempting to mitigate the track differences between PGPI and WOI, *i.e.* the pilot project in five provincial administrative units launched in 2008, but these attempts largely failed (*e.g.* Wang, 2014).

2 The current pension system in China has notable urban–rural cleavage (Whyte, 2010). In rural China, no formal pension was installed until late 2009, when the New Rural Old Age Insurance (NROAI) was piloted. The focus of this study is on urban China. For more information about the NROAI, *see* Shi (2006).

3 The work unit, literally, refers to the place of employment. During the socialist regime in China (from the 1950s to the 1970s), almost all welfare benefits, including but not limited to apartment assignment, medical care and pension, were tied to the work unit (Walder, 1988).

4 According to the exchange rate as of 8 June 2018, 1 Yuan is approximately US $0.157.

5 See http://www.jlsi.gov.cn/ssb/sbdt/14852.jhtml.

6 For instance, the pension benefits for enterprise retirees were raised by 10 per cent in 2011, which was tantamount to an increase of 140 Yuan (US $21.98) per month.

7 In some large cities, older individuals who have no social security benefits may receive support from the local government. For example, senior citizens of Beijing who were 60 years old and over and had no social security benefits could receive 200 Yuan per month from the Beijing government after 2008, but receivers of this kind of support are rare in our analytical sample (3.74%), so we do not examine them.

8 Note that the meaning of spouse can be vaguely defined and include co-habitants. That is why the percentage of those living with spouses is higher than that for married people.

9 Note that factor analysis is a dimension-reduction method mainly for continuous items, but it is used here for categorical ones. Although this is a common practice, we check the analytical robustness in our supplementary analyses (available upon request) using the summation rather than factor score of the corresponding items. Similar analytical results were obtained, so factor analysis based on categorical items should not bring about severe concerns. In fact, the pairwise correlation between the factor-based measure and the summation-based measure is 0.98.

10 In our supplementary analyses (available upon request), we switch the reference level to URSPI. It is shown that those who receive PGPI benefits have 45 per cent ($\exp^{0.371} - 1$) higher odds of reporting a better status of life satisfaction than those who have URSPI benefits.

**11** Results based on the OLS model report similar patterns.

Ethical standards. Ethical approval was not required.

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Appendix
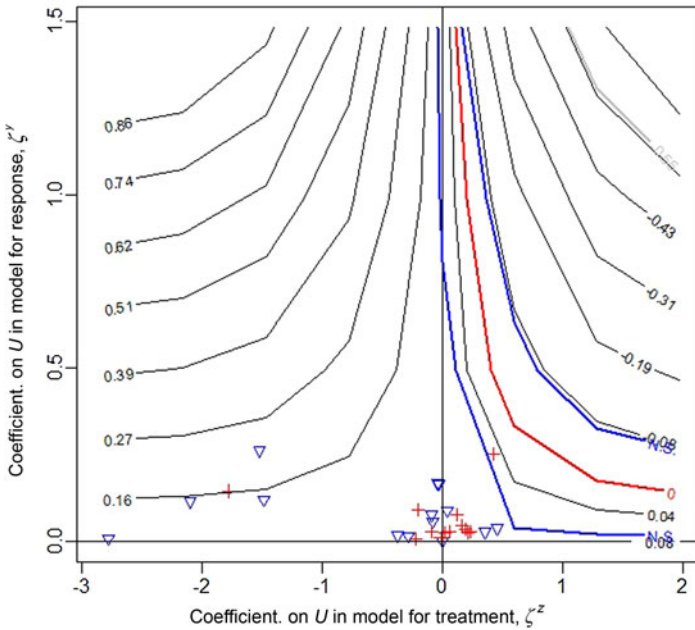
Figure A1. Results of the sensitivity analysis.

Notes: In the sensitivity analysis, an unobserved variable U was simulated in terms of its correlation with life satisfaction (denoted by ζ^y) and correlation with pension scheme (denoted by ζ^z). What we see is how our analytical result changes by manipulation the values of ζ^y and ζ^z. Robustness to the omitted variable problem can be confirmed if the combination of ζ^y and ζ^z has to reach a large value to reduce the coefficient of interest to zero. That is to say, if U has to be strongly related to both the predictor and the outcome to nullify the coefficient, U itself is unlikely to exist, so that the estimated coefficient is robust. In the figure, what is of interest is the line marked with 0, which stands for the combination of ζ^y and ζ^z that nullifies the coefficient. For example, a zero effect of pension scheme on life satisfaction would return if we control for a U that has a correlation strength of 0.5 with pension scheme, and a correlation strength of around 0.5 with life satisfaction. Generally speaking, the U values on this line are unlikely to be observed in practice, due to the relative distance of this line to the observed covariates that are marked with the symbols $\triangledown$ and $+$ ($+$ stands for the observed covariates that have a positive effect on life satisfaction and $\triangledown$ stands for those with a negative effect, which are multiplied by -1 to become positive). In this regard, we have evidence for the robustness of our analyses.

Table A1. Result of the factor analysis for physical activity hardship

	Factor loading
Can you clean up and tidy yourself (*e.g.* hair, shaving, make-up, *etc.*)?	0.811
Can you wear your own clothes?	0.828
Can you bathe yourself (shower or bath)?	0.846
Can you eat for yourself?	0.754
Can you take medicine yourself?	0.772
Can you go to the toilet yourself?	0.844
Can you move from bed to bedside chair yourself?	0.806
Can you walk indoors?	0.754
Can you go up and down the stairs?	0.722
In the past 12 months, have you ever fallen?	0.256
Can you walk outside?	0.821
Can you use public transportation (such as buses) by yourself?	0.690
Can you shop yourself?	0.782
Can you manage your own money?	0.668
Can you lift up five kilograms of weight?	0.565
Can you cook for yourself?	0.755
Can you do housework yourself?	0.796
Variance explained (%)	55.70
Cronbach's alpha	0.929

Note: Rotation method is orthogonal varimax.

Table A2. Descriptive statistics

	% or mean (SD)
Pension type:	
URSPI	51.830
WOI	13.950
PGPI	34.230
Log-transformed annual income	10.248 (0.854)
Gender (female)	44.200
Age	70.564 (8.080)
Educational attainment:	
1 = Illiterate	8.000
2 = Basic literacy class	2.030
3 = Preliminary school	22.220
4 = Junior middle school	31.900
5 = Senior middle school	21.340
6 = Associate degree and above	14.520
Household registration status (agricultural)	4.900
Marital status (married)	72.400
Co-residing with a son (yes)	29.560
Co-residing with a daughter (yes)	12.350
Co-residing with the spouse (yes)	78.138
Number of sons	1.214 (0.934)
Number of daughters	1.207 (1.051)
Chronic diseases	0.719 (0.449)
Negative life events	0.259 (0.524)
Self-reported value for the society:	
1 = Entirely disagree	10.910
2 = Disagree	18.420
3 = Neutral	23.170
4 = Agree	30.860
5 = Entirely agree	16.640
Life satisfaction:	
1 = Very unsatisfied	1.400
2 = Unsatisfied	4.580
3 = Neutral	18.760

(*Continued*)

Table A2. (*Continued.*)

	% or mean (SD)
4 = Satisfied	39.950
5 = Very satisfied	35.300
Number of owned apartments	0.919 (0.550)
Log-transformed pension benefits	7.548 (0.929)
Work unit type before retirement:	
1 = Government and Communist Party institutions	7.160
2 = Enterprises	59.360
3 = Public institutions	27.610
4 = Social groups	0.980
5 = Without explicit work unit	0.980
6 = Self-employment	1.740
7 = Military services	0.670
8 = Others	1.500

Notes: N = 4,341. SD: standard deviation. URSPI: urban residents' social pension insurance. WOI: worker's old-age insurance. PGPI: pension for government and public institutions.