Ageing & Society (2022), **42**, 1280–1298
doi:10.1017/S0144686X20001440

ARTICLE

Age-related loss of resources and perceived old age in China

Huijun Liu[1], Ru Yang[2] and Zhixin Feng[3]*

[1]Institute for Population and Development Studies, Aging and Health Research Center, School of Public Policy and Administration, Xi'an Jiaotong University, Xi'an, China, [2]School of Public Policy and Administration, Xi'an Jiaotong University, Xi'an, China and [3]School of Geography and Planning, Sun Yat-Sen University, Guangzhou, China
*Corresponding author. Email: frankfengs@gmail.com

(Accepted 23 September 2020; first published online 4 November 2020)

Abstract

Life expectancy in China has increased. This paper explores the age when older adults (aged 60 and above) consider themselves to be an 'older person' and how age-related loss of resources (five dimensions: early cumulative factors, decline and loss of health resources, reduction and loss of economic resources, weakening and loss of social support resources, and personal role transition and experiences of losing family members) could impact their perceived old age. Using two waves of data from the China Longitudinal Ageing Social Survey (CLASS) in 2014 and 2016 (6,244 participants in 2014 and 2,989 participants in both 2014 and 2016), we found that the mean perceived old age is around 70 years at baseline (2014). Higher level of educational attainment and occupational types (early cumulative factors), better health condition, receiving support from friends and taking care of grandchildren are significantly associated with the perception that old age begins at an older age at baseline, while being Han-Chinese, being an urban resident (early cumulative factors) and reporting better health condition have significant positive effects on the perception that old age begins at an older age in the later wave. Our findings suggest that the age standard of older adults should be adjusted dynamically in response to social development and longevity, and also highlight the importance of early cumulative factors in shaping the ageing process besides age-related factors.

Keywords: perceived old age; age-related loss of resources; Chinese older adults

Introduction

Life expectancy at birth has increased substantially around the world, and China is no exception. Life expectancy rose from 67.9 years in 1981 to 76.5 years in 2010 in China due to improvements in living conditions and socio-economic development (Zeng and George, 2002; Phillips and Feng, 2015; An, 2017). However, longer life does not mean ageing well. It could also link with age-related loss of resources, such as functional impairment, personal role transition and experiences of losing family

members (*i.e.* transferring from being married to being widowed) that could reduce the quality of life of older people. Indeed, with worldwide increasing population ageing, to guarantee how people age well would be a challenge for most ageing societies. A better understanding of the ageing process is important in meeting this challenge and could improve the quality of life of older people. Previous studies found that preserving a positive attitude towards ageing, functioning as a self-enhancing strategy, can contribute to the health and wellbeing of older adults living in cultures that stigmatise being old (Westerhof and Barrett, 2005; Levy *et al.*, 2016). When people have the consciousness of 'I am old', their attitude and behaviour will be old, and they lose the enthusiasm for life, leaving no hope for the future.

Since the 20th century, the starting point of older adults has been defined by chronological age. The United Nations (2019) generally uses 60+ years to refer to the older population; most developed countries adopt the age of 65 years as a starting point of older adults and developing countries usually use the age of 60 years as a starting point of older adults. However, the rigid definition on being old based on chronological age (as a static and homogeneous point) ignores the individual differences within older adults, which may no longer meet the practical needs of social and economic development (Sanderson and Scherbov, 2010). The age at which people consider themselves as older people was considered to be a measure of individual ageing, because it provides a view of the ageing process and encompasses more social, psychological and personal meaning than chronological age (Montepare, 2009).

In recent decades, measures of (individual) ageing have received increased attention. However, previous studies mainly focused on subjective age in the sense of feelings of age and ideal age or self-perception of ageing in the sense of whether feeling old in Western countries (*e.g.* Barrett and Montepare, 2015; Diehl *et al.*, 2015; Bordone *et al.*, 2020). A few studies also paid attention to the perceived start of old age at the end of middle age (Kaufman and Elder, 2002; Demakakos *et al.*, 2007; Barrett and Toothman, 2014; Chopik *et al.*, 2018). However, few studies have attempted to identify perceived old age and its potential predictors in China, a country that has the largest ageing population in the world. Different from Western countries, where youth is given more cultural value, it is unclear whether people in China will be more willing to accept the older status, due to the prevalence of Confucian culture and long history of respecting older people (Sung, 2001). Although previous findings show that older Chinese who were widowed or in poorer health, had lower levels of education and less income were found to be more likely to think of themselves as older people (Liang, 2014), what factors of age-related loss of resources that shape one's perception of the beginning of old age in contemporary China is still not clear.

Theory and reality of age-related loss of resources and perceived old age

The lifecourse theory proposed by Elder (1985) provides a perspective for the research of age-related loss of resources and perceived old age. It emphasises the accumulation of individual resources over one's lifecourse, especially the difference in accessibility and availability of resources, and highlights the importance of this difference in one's later life. Resources are multifaceted: they can be physical and

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

economic resources from individuals; or they also can be visible or invisible resources that individuals obtain from society, such as support resources from social networks and resources given by virtue of their social roles. This article, thus, explores five aspects of age-related loss of resources – early cumulative factors; the decline and loss of health resources; the reduction and loss of economic resources; the weakening and loss of social support resources; and personal role transition and experiences of losing family members – and their associations with perceived old age.

Early cumulative factors

Early cumulative factors, such as gender, ethnicity, location of birth and area of residence, which often associate with the structures of opportunity and historical environment at birth, may be important predictors of perceived old age. For example, men and women who have different life domains and play different roles in family and work at different points in their lifecycle, may be given different meanings to age-related roles (Logan *et al.*, 1992; Hubley and Russell, 2009). Economic situation or economic security (pension) in the later life of older adults may also be determined by the accumulation of economic resources during their early years. Therefore, education and occupation type are treated as early cumulative factors in China. These factors will continue to affect individual resources accumulated during their lifecourse (Hu, 2009). The view of accumulating disadvantages is strongly linked to the impact of early cumulative factors on the accessibility of resources throughout a person's life (Elder, 1985). Some studies are concerned the associations between gender, chronological age, education and subjective ages and the findings are inconsistent (*i.e.* Ward, 1977; Bultena and Powers, 1978; Markides and Ray, 1988; Rozario and Derienzis, 2009; Bergland *et al.*, 2014). Only two studies examined the difference in perceived old age varied by social location, and found that men and older adults perceived old age beginning at an older age (Chopik *et al.*, 2018) than women and younger adults, and lower level of educational attainment was also correlated to an earlier end of middle age (Barrett and Toothman, 2014).

Decline and loss of health resources

As people grow older, their physical functions are more likely to decline, and health-related problems gradually appear. Decline of physical functions and worsening health are the signals of being old and they are the most broadly accepted reasons for beginning to feel old (Hubley and Russell, 2009). Knoll *et al.* (2004) suggested that functional limitations could be more important to the construction of subjective age than other underlying health-related causes; while, Hubley and Russell (2009) suggested that the relative importance of different dimensions of health to subjective age should be evaluated and they found that certain combinations of health dimensions (Medical Outcomes Study Short Form) and satisfaction with health accounted for relatively large proportions of the variance in subjective age and satisfaction with age, while subjective age and satisfaction with age were explained by different combinations of health dimensions. Only one study has

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

found that poor health was associated with an earlier beginning and end of middle age (Barrett and Toothman, 2014).

Reduction and loss of economic resources

When people become older, they gradually lose their ability to get remuneration from the labour market, and will face reduction and loss of their economic resources. Previous literature found that people with poor social and economic conditions were more likely to classify themselves as older people (George *et al.*, 1980; Mutran and George, 1982), and people with higher socio-economic status generally thought that old age starts relatively late (Drevenstedt, 1976). However, a study concluded that income has little impact on subjective age (Rubin and Berntsen, 2006). In Rubin and Berntsen's (2006) study, subjective age was defined as 'the age people think of themselves as being'. Inconsistent findings could be due to different measures of subjective ageing. This suggests that more evidence is needed for the association between reduction or loss of economic resources and subjective views of ageing, especially in perceived old age.

Weakening and loss of social support resources

Coleman (2008) notes that older people can access various social support resources through different social networks; however, with their gradual increase in age and the weakening of their physical functions, older people are constantly withdrawing from the work field. In addition, it has been found that older age was associated with being more likely to be excluded from social activities (Feng *et al.*, 2018). Older people's social networks are getting smaller and smaller, and the support they receive from their networks could also decrease (Morgan, 1988; Cornwell *et al.*, 2008; Wrzus *et al.*, 2013). A large number of studies from China have shown that social support resources have a significant positive impact on levels of depression and subjective wellbeing among older people (*i.e.* Hu *et al.*, 2018), and these weakening and loss of social support resources may affect people's perception of old age.

Personal role transitions and experiences of losing family members

The role a person assumes essentially means the resources that they possess, and the transformation of roles can cause changes in the resources assigned by their role (Elder, 1985). Retirement is the main transition in personal role which older people experience that results in the loss of resources in terms of power, social status and economic benefits from their work. Previous studies have found that retirement was positively related to self-identification as being old (Mutran and George, 1982). However, others found that retirement had no impact on subjective age after controlling for other variables (Logan *et al.*, 1992). From the related perspective of lifecourse theory, some other life events could also change the roles of older people (*e.g.* the death of a spouse, the death of children, children getting married, and so on) in ways that are associated with subjective ageing. A study found that feeling old was significantly associated with retirement and death of loved ones (Bordone

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

et al., 2020). However, no study examined whether role transition and experience of losing family members was associated with perceived old age.

In addition, Chinese older people who usually take care of their family members, such as their older parents and grandchildren, are expected to receive financial or other support from their children (Feng *et al.*, 2015), which may shape their perception of being old. Although grandparenting is expected to be beneficial to subjective ageing, mainly because of having a sense of purpose and a form of daily activity (Kivnick, 1983), it is argued that grandparenting can be a risk factor since the demands and pressures are intrinsic to care-giving (Burn and Szoeke, 2015). Empirical evidence confirmed the negative association between care of grandchildren and subjective age (Bordone and Arpino, 2016).

In sum, results from previous studies are inconsistent and evidence on the associations between early cumulative factors, loss of health and perceived old age tends to be very limited. In addition, the impact of economic resources, weakening and loss of social support resources, and personal role transitions and experiences of losing family members on perceived old age have also not been well investigated. Based on the perspective of lifecourse theory, this article intends to explore perceived old age of older people, and its association with five lifecourse perspectives, in the context of Chinese culture.

We hypothesise that:

(1) Perceived old age would differ significantly between men and women due to their different life domains, and different roles in the family and at work at different stages in their lifecycle; and older people who had a higher level of education and occupational status would perceive old age starting at a later age due to accumulation of beneficial effects in their later life.
(2) Older people with poorer health status would perceive old age starting at a younger age than those with better health status (decline and loss of health resources).
(3) Older people who were engaged in work and have higher income would perceive old age starting at an older age than those who were not engaged in work and have lower income (reduction and loss of economic resources).
(4) Perceived old age would decrease with less social support resources for older people (weakening and loss of social support resources).
(5) Older people who experienced loss of family members and personal role transition would perceive old age starting at an earlier age than those who did not experience such incidents (personal role transitions and experiences of losing family members).
(6) All five lifecourse perspectives would have both short-term and long-term associations with perceived old age.

Methods

Data

The data used in this article are from the two waves of the Chinese Longitudinal Ageing Social Survey (CLASS), which is a nationwide survey implemented by Renmin University of China and academic institutions in 2014 and 2016.

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

The survey covers 476 village/residential committees in 30 provinces/autonomous regions/municipalities across the country, and use a stratified multi-stage probability sampling method.[1] There were 6,244 individuals aged 60 and above with sufficient data in the 2014 baseline survey (who provided completed information on perceived old age and all independent variables) and 2,989 cases followed up in 2016 are used in this study. Descriptive characteristics for baseline variables are reported in Table 1.

Dependent variable

Perceived boundaries of middle and old age are expected to reflect one's personal model of ageing (Furstenberg, 1989), and a youthful subjective age (considering being old at an older age) is an indicator of successful ageing (Uotinen *et al.*, 2003). In this study, perceived old age is measured from the question: 'At what age do you think you become an older person?' This measure is shaped by both Chinese culture norms and their personal experience and it could distinguish the age of perceived old age from retirement age (Liu *et al.*, 2020). This variable is a numerical variable; a higher value indicates a higher age is considered to be old.

Independent variables

Five aspects of age-related loss of resources are considered as independent variables in this study, and chronological age is used as the control variable. The measures of the independent variables are presented in Table 1.

Early cumulative factors include gender, ethnicity, educational attainment, occupation type (general workers in agriculture, livestock and fishing, administrators, professionals, general staff, other (self-employed/freelacer/unemployed/other), and area of residence (urban or rural). *Decline and poorer health outcomes* include changes in health status, activities of daily living (ADLs), presence of any chronic disease,[2] cognitive ability score and emotional status score. *Reduction and loss of economic resources* include whether respondents are engaged in work with income at present, and their income status. *Weakening and loss of social support resources* include support from family and friends. *Personal role transition and experiences of losing family members* include retirement, whether their children or grandchildren got married in the past 12 months, whether they experienced the death of a spouse in the past 12 months, whether they experienced the death of a child in the past 12 months, and taking care of their older parents and grandchildren. All these variables are measured in 2014.

Data analysis

Descriptive statistics analysis is used to present the perceived old age for different age groups. Then, ordinary least squares (OLS) regression models are used to test the associations between five aspects of age-related loss of resources and perceived old age in 2014, by comparing a series of nested linear regression models. Model 1 focuses on the impact of early cumulative factors on perceived old age after controlling for chronological age. For Models 2–5, the variables of decline and loss of health resources, reduction and loss of economic resources, weakening and loss

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

Table 1. Summary of variables

Variable	Description	%
Chronological age	60–69	39.32
	70–79	38.77
	80–89	19.80
	90 and above	2.11
Early cumulative factors:		
Gender	Male	54.64
	Female	45.36
Ethnicity	Non-Han-Chinese	6.07
	Han-Chinese	93.93
Educational attainment	Illiterate	19.91
	Primary school	36.47
	Junior high school	23.69
	High school and above	19.94
Occupation type	General workers in agriculture, livestock and fishing	40.07
	Administrators	8.94
	Professionals	11.42
	General staff	28.36
	Other (including self-employed, freelancer, unemployed, other)	11.21
Resident areas	Urban	64.46
	Rural	35.54
Decline and loss of health resources:		
Changes in health status	Get worse	38.44
	No change	52.85
	Get better	8.71

(*Continued*)

Table 1. (*Continued.*)

Variable	Description	%
Activities of daily living	It includes six indexes, such as eating, dressing, getting up and down, going to the toilet, indoor walking and bathing	Score range of each item = 1–3
		Total score range = 6–18
		Mean = 6.13
		Coefficient α = 0.93
Chronic disease	Do not have chronic disease	26.89
	Have chronic disease	73.11
Cognitive ability score	Measured with Chinese version of the MMSE	Total score range = 0–16 Mean = 12.90
		Coefficient α = 0.79
Emotional status score	Measured with CES-D with 12 items	Total score range = 13–36
		Mean = 30.76
		Coefficient α = 0.81
Reduction and loss of economic resources:		
Engaged in work with income at present	No	78.78
	Yes	21.22
Individual income (yuan)	The total personal income of the respondent over the past 12 months	Income range = 0–550,000
Weakening and loss of social support resources:		
Family support	Measured by three questions: (1) At least how many family members or relatives are you able to meet or contact each month? (2) How many family members or relatives are you comfortable talking private affairs with? (3) How many family members or relatives can help you when you need?	Score range of each item = 0–9
		Total score range = 0–27
		Mean = 8.69
		Coefficient α = 0.80

(*Continued*)

Table 1. (*Continued.*)

Variable	Description	%
Friend support	Measured by three questions: (1) At least how many friends are you able to meet each month? (2) how many friends are you comfortable talking about private affairs with? (3) How many friends can help you when you need?	Score range of each item = 0–9
		Total score range = 0–27
		Mean = 10.68
		Coefficient α = 0.84
Personal role transition and experiences of losing family member:		
Retire or stop working	In the past 12 months, whether the respondent retired or stopped working?	
	No	99.04
	Yes	0.96
Children or grandchildren got married	In the past 12 months, whether the respondent experienced the marriage event of children or grandchildren?	
	No	94.57
	Yes	5.43
Spouse died	In the past 12 months, whether the respondent encountered the death of a spouse?	
	No	98.51
	Yes	1.49
Children died	In the past 12 months, whether the respondent encountered the death of a child?	
	No	99.68
	Yes	0.32
Take care of parents	In the past month, whether the respondent (and their spouse) took care of their parents?	
	No	91.72
	Yes	8.28
Take care of grandchildren	In the past 12 months, whether the respondent took care of grandchildren?	
	No	58.95
	Yes	41.05

Notes: MMSE: Mini-Mental State Examination. CES-D: Center for Epidemiologic Studies Depression Scale.

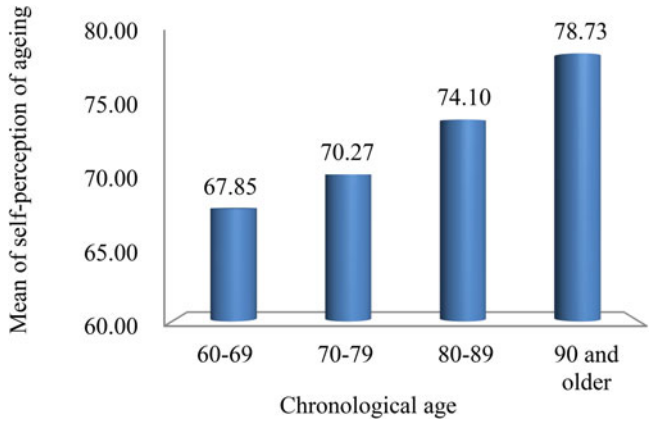

Figure 1. Distribution of self-perceptions of ageing.

of social support resources, and personal role transition and experiences of losing a family member are added step by step. Lastly, within the follow-up sample, we examine the associations between baseline age-related loss of resources and perceived old age both in 2014 and 2016. This helps to understand whether age-related loss of resources has short-term or long-term effects on perceived old age.

In addition, in order to eliminate the influence of observation heterogeneity and compare the importance of different independent variables between the different models or in the same model, this article carries out dimensionless processing of regression coefficients (Yang, 2012). Therefore, a standardised coefficient is used when comparing the data results in the models. The potential multicollinearity among variables were conducted, variance inflation factor values of all variables are between 1.01 and 2.60, which means that there is no multicollinearity in these variables. All data analysis in are conducted using the software Stata 13.

Results

Distribution of perceived old age across chronological age groups

Comparing the perceived old age and chronological age, the mean of perceived old age is around 70 years, and varies significantly by different age groups of older adults. Figure 1 shows that the mean of perceived old age among people aged 90 and above is 78.7, much higher than that of people aged between 60 and 69 (mean = 67.9). This suggests that the perceived start of old age increases with the chronological age of the respondents. Although the Chinese government sets age 60 years as a starting point to classify an older person, most people do not consider themselves as an older adult at age 60.

OLS results for the associations between age-based loss of resources and perceived old age at baseline (2014)

The results of Models 1–5 in Table 2 show that there was no significant difference for the estimates of five aspects of age-related loss of resources when they were

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

added step by step. Therefore, the results illustrated here are based on the final model (Model 5). Results of Model 5 show that there was significantly positive association between higher chronological age and higher perceived old age. Among early accumulative factors, higher educational attainment (high school and above, junior high school, primary school comparing to illiterate) and better occupational status (administrators, professionals, general staff and others comparing to general workers in agriculture, livestock and fishing) were also significantly positively associated with higher perceived old age; however, the associations between gender, ethnicity, area of residence and perceived old age were not statistically significant.

In terms of the loss of health or economic resources, people who reported their health had not changed or had improved reported higher perceived old age than those older adults who reported that their health had worsened. Older adults with chronic diseases reported lower perceived old age than those without chronic diseases. In addition, older people who had a higher cognitive ability score and better positive emotional status were significantly associated with higher perceived old age. Older people who were engaged in work reported higher perceived old age than those were not working.

For social support resources and role transition, only receiving support from friends and taking care of grandchildren were significantly associated with perceived old age. Results suggest that the more support older people received from friends, the higher perceived old age they reported; however, older adults who took care of grandchildren reported a lower perceived old age than their counterparts.

OLS results for the associations between age-based loss of resources and perceived old age at both 2014 and 2016 among those who were in both waves of CLASS

In order to examine whether age-based loss of resources has short-term or long-term association with perceived old age, we further used the perceived old age in 2016 as the dependent variable to examine the associations between baseline age-related loss of resources and perceived old age at follow-up wave. Since nearly 40 per cent of respondents were lost to follow-up in 2016, which may cause bias of estimates, we also re-ran the final model in Table 2 by restricting the sample to those who were followed up in 2016 (*see* Table 3) (We also tested whether there were differences between those who mainly participated at baseline assessment and those who participated at both assessments; the results are shown in the online supplementary material.) Similar to the final model with 6,244 respondents in Table 2, the associations between chronological age, educational attainment, occupational status, changes in health status, chronic disease, emotional status, taking care of grandchildren and perceived old age in 2014 among 2,989 respondents (who were in both waves) remain significant and show similar patterns (*see* Table 3). However, the associations between receiving support from friends, cognitive ability and perceived old age were no longer significant, while gender and ethnicity became significantly associated with perceived old age in 2014 in Table 3. In terms of the impact of age-based loss of resources on perceived old age in 2016, there was no substantial difference between models with and without controlledfor perceived old age in 2014 (in columns 2 and 3, respectively). Estimates show that

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

Table 2. Multiple linear regression results of the associations between age-based loss of resources and self-perceptions of ageing at baseline

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
			Standardised coefficients		
Chronological age (Ref. 60–69):					
70–79	0.122***	0.134***	0.131***	0.131***	0.128***
80–89	0.252***	0.276***	0.272***	0.273***	0.265***
90 and above	0.159***	0.169***	0.167***	0.168***	0.163***
Early cumulative factors:					
Female (Ref. Male)	0.013	0.024	0.022	0.021	0.019
Han-Chinese (Ref. Non-Han-Chinese)	0.020	0.017	0.017	0.017	0.017
Education level (Ref. Illiterate):					
Primary school	0.039*	0.018	0.017	0.017	0.017
Junior high school	0.090***	0.060**	0.058**	0.057**	0.056**
High school and above	0.085***	0.052**	0.049**	0.047*	0.045*
Occupation type (Ref. General workers in agriculture, livestock and fishing):					
Administrators	0.102***	0.076***	0.069***	0.067***	0.066***
Professionals	0.101***	0.079***	0.072***	0.072***	0.071***
General staff	0.120***	0.090***	0.081***	0.080***	0.078***
Others	0.072***	0.054***	0.054***	0.054***	0.053***
Rural residents (Ref. Urban)	−0.022	−0.006	−0.001	−0.001	−0.003
Decline and loss of health resources:					
Changes in health status (Ref. Get worse):					
No change		0.085***	0.085***	0.085***	0.085***

(*Continued*)

Table 2. (*Continued.*)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5
Get better		0.049***	0.049***	0.049***	0.049***
Activities of daily living		0.015	0.014	0.015	0.015
Cognitive ability score		0.035**	0.035**	0.033*	0.033*
Has chronic diseases (Ref. No)		−0.042**	−0.043***	−0.041**	−0.041**
Emotional status score		0.140***	0.141***	0.139***	0.141***
Reduction and loss of economic resources:					
Engaged in work (Ref. No)			−0.023	−0.024	−0.024
Individual income (Ln + 1)			0.014	0.014	0.013
Weakening and loss of social support resources:					
Family support				−0.012	−0.011
Friend support				0.029*	0.029*
Transition and loss experiences of role:					
Retire/stop working (Ref. No)					0.008
Children/grandchildren got married (Ref. No)					−0.002
Spouse died (Ref. No)					0.015
Children died (Ref. No)					−0.001
Take care of parents (Ref. No)					0.017
Take care of grandchildren (Ref. No)					−0.037**
Constant	64.20***	51.90***	51.52***	51.51***	51.85***
R^2	0.1152	0.1515	0.1520	0.1527	0.1545

Notes: N = 6,244. Ref.: reference item.
Significance levels: *$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.

Table 3. Multiple linear regression results of the association between age-based loss of resources and self-perceptions of ageing among follow-ups

Variable	(1) 2014	(2) 2016	(3) 2016
	Standardised coefficients		
Chronological age (Ref. 60–69):			
70–79	0.175***	0.036*	0.031
80–89	0.265***	0.028	0.021
90 and above	0.139***	0.015	0.011
Early cumulative factors:			
Female (Ref. Male)	0.037**	0.002	0.001
Han-Chinese (Ref. Non-Han-Chinese)	0.03*	0.048*	0.047**
Education level (Ref. Illiterate):			
Primary school	0.049**	−0.007	−0.008
Junior high school	0.079***	0.001	−0.001
High school and above	0.079***	0.043	0.041
Occupation type (Ref. General workers in agriculture, livestock and fishing):			
Administrators	0.057**	−0.02	−0.021
Professionals	0.058**	−0.021	−0.022
General staff	0.067**	0.001	−0.001
Others	0.042**	0.003	0.001
Rural residents (Ref. Urban)	−0.001	−0.067***	−0.067***
Decline and loss of health resources:			
Changes in health status (Ref. Get worse):			
No change	0.072***	0.002	0
Get better	0.05***	−0.008	−0.009
Activities of daily living	−0.007	0	0
Cognitive ability	0.023	−0.001	−0.002
Has chronic diseases (Ref. No)	−0.055***	−0.044**	−0.042**
Emotional status	0.146***	0.037*	0.033
Reduction and loss of economic resources:			
Engaged in paid work (Ref. No)	−0.03	0	0.001
Individual income (Ln + 1)	0.024	0.009	0.008
Weakening and loss of social support resources:			
Family support	0.002	−0.006	−0.006
Friend support	0.021	−0.017	−0.017

(*Continued*)

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

Table 3. (*Continued.*)

Variable	(1) 2014	(2) 2016	(3) 2016
Transition and loss experiences of role:			
Retired/stopped working (Ref. No)	−0.018	0.004	0.005
Children/grandchildren got married (Ref. No)	−0.011	−0.012	−0.012
Spouse died (Ref. No)	0.015	0.014	0.013
Children died (Ref. No)	0	0.024	0.024
Taking care of older parents (Ref. No)	0.007	−0.001	−0.001
Taking care of grandchildren (Ref. No)	−0.034*	−0.011	−0.01
Perceived old age in 2014			0.026
Constant	53.01***	67.3***	65.8***

Notes: N = 2,989. Ref.: reference item. All the independent variables are from 2014. Perceived old age in 2014 was further controlled in the second model of 2016 (column 3).

Han-Chinese respondents reported significantly higher perceived old age than non-Han-Chinese respondents; rural residents reported significantly lower perceived old age than urban residents; while older adults with chronic diseases reported significantly lower perceived old age than those without chronic diseases.

Discussion

Our findings suggest that chronological age plays a predominant role in perceived old age in the short term (only at baseline); but such an effect becomes not significant in the long term after controlled-for perceived old age at baseline. Older adults' perception of an older adult is around 70 years. In addition, the perception of old age increases with one's chronological age. This implies that most Chinese older people do not regard that they are an older adult at aged 60 even though the Chinese government sets the age of 60 years as the start of old age. Similar to people in Western countries with youth-oriented cultures, Chinese older people also tend to reject their old-age status, despite the fact that China has a profound culture of respect and admiration for older adults (Choi *et al.*, 2014). This result may also indicate that it is out of date to define older adults at 60 years, and that the age standard of older adults should be adjusted dynamically in response to social development and longevity (Sanderson and Scherbov, 2010).

Consistent with the previous finding that a lower level of education was correlated to an earlier end of middle age (Barrett and Toothman, 2014), our results show that higher levels of education and occupational status as early cumulative factors were significantly related to the perception that old age begins at an older age in 2014, though their coefficients are no longer significant in 2016. This is partly aligned with Hypothesis 1. In addition, Barrett and Toothman (2014) also found weaker evidence for a longitudinal association between education and the perceived end of middle age. While the impact of residency on perceived old age

https://doi.org/10.1017/S0144686X20001440 Published online by Cambridge University Press

in 2016 becomes significant in our study, these results may suggest that the short-time impact of socio-economic status on perceived old age is finally replaced by that of rural–urban division in the long term. Individuals' socio-economic status is highly associated with where they grow up or live, and rural–urban division caused the greatest differences in education and occupational status of older people. Additionally, ethnicity is significantly associated with perceived old age in both the short and long term. Our findings highlight that the individual's ageing process is not only reflected in old age, but also shaped by their early life. That is to say, the ageing phenomenon is a process that accumulates through an individual's life, and inequality in accessibility to economic resources due to socio-economic status or rural–urban division in China cause health inequalities in early life and lead to different ageing processes by accumulation of disadvantage in later life.

In line with a previous study that poor health was associated with the earlier start of old age and end of middle age (Barrett and Toothman, 2014), this article also found that the decline and poorer health outcomes were important factors that affect perceived old age, which supports Hypothesis 2. However, ADL ability and cognitive function have no effect on perceived old age, and the association between self-perceived health decline and perceived old age remains in the short term in this study. These findings do not support the statement of Knoll *et al.* (2004) showing that functional limitations could be more important to the construction of subjective age than other underlying health-related causes; while we used different dimensions of health, as Hubley and Russell (2009) suggested, and found that only chronic diseases play an important role in shaping perceived old age in both the short and long term.

Our results suggest that the reduction and loss of economic resources, and social support resources, had no impact on perceived old age, which rejects Hypotheses 3 and 4. Among the variables of role transition and loss experience, only the negative impact of providing care for grandchildren on perceived old age is significant in the short term, which suggests that older people who provide care for their grandchildren report an older age from the start of being old in China. This partly supports Hypothesis 5. Our findings extend previous study in that care of grandchildren is not only negatively associated with subjective age (Bordone and Arpino, 2016), but also negatively correlated to perceived old age in China, though the negative effect no longer exists in the long term. A possible explanation is that the growth of the third generation makes people feel that their age is gradually increasing. In addition, taking care of grandchildren, which is usually physically and mentally demanding, may become a challenge or burden for older people and even cause harm to their health when this responsibility is beyond older people's affordability (Feng *et al.*, 2015). The theory of role strain (Goode, 1960) also provides a reasonable explanation in that taking care of grandchildren takes up a lot of time and reduces opportunities for social interaction or enjoying free time. When older people are asked to perform certain roles, they may feel coerced or perplexed about the expectations of the role, resulting in stress in their later lives (Hinterlong *et al.*, 2007; Hayslip *et al.*, 2014), even creating a negative status at the physiological, psychological and spiritual level (Mehta and Leng, 2012; Hayslip *et al.*, 2014).

This study also has some limitations. Although we used two-wave national representative data to explore the associations between age-related loss of resources and

perceived old age, a large percentage of respondents could not be followed up, which limited us to precisely estimating the causal relationships between age-related loss of resources, especially health condition and perceived old age. Some observations were excluded, due to missing values in core variables, which may create bias for the estimations. Secondly, perceived old age will undoubtedly be influenced by the personality traits of openness and extroversion (Hubley and Hultsci, 1994). However, the CLASS data lack information on personality traits. In this study, we only focused on the causal direction leading from health status to perceived old age. In fact, perceived old age is also considered to be an important indicator for health outcomes (Demakakos *et al.*, 2007; Barrett and Toothman, 2014). To examine the potential reciprocal relationship between health status and perceived old age of older adults could be a research direction in future. Finally, perceived old age was only measured with a single item which may not fully capture the complicated meanings of perceiving being old, therefore, more elaborate assessment is needed in future studies.

Despite these limitations, we believe that our analyses significantly contribute to previous studies on age-related loss of resources and self-perception of ageing using a two-wave study. The results highlight the need to weaken the social age norm at the policy level, such as separating pension eligibility from mandatory retirement and separating retirement age from the definition of older adults based on chronological age; this could help to adjust the age standard of older adults in response to social development and longevity. More health promotion programmes targeting older adults should be initiated to construct older adults' self-perception of ageing by preventing the onset of chronic diseases or active intervention in depression.

Notes

1 For the details of data collection, *see* the CLASS webpage: http://class.ruc.edu.cn/index.php?r=info/introduce&cid=6.

2 Chronic diseases include hypertension, heart disease/coronary heart disease, diabetes, cerebrovascular disease, kidney disease, liver disease, tuberculosis, rheumatism, cervical/lumbar spondylosis, arthritis, breast disease, reproductive system disease, prostate disease, urinary system disease, glaucoma/cataract, cancer/malignant tumour, Alzheimer's disease, osteoporosis, chronic bronchitis/other respiratory diseases, nervous system diseases, gastroenteritis or other digestive diseases, Parkinson's disease, deafness, *etc.*

Supplementary material. The supplementary material for this article can be found at https://doi.org/10.1017/S0144686X20001440.

Acknowledgements. Data analysed in this paper were collected by the research project "China Longitudinal Aging Social Survey (CLASS)," sponsored by Renmin University of China. The CLASS research project was conducted by the Institute of Gerontology and National Survey Research Center of Renmin University. The authors acknowledge the assistance of the institutes and individuals aforementioned in providing data. The views expressed in this paper are the authors' own.

References

An (2017) *Chinese Average Life Expectancy Increases by 8.6 Years in 35 Years*. Available at http://www.xinhuanet.com/english/2017-09/29/c_136648314.htm.

Barrett AE and Montepare JM (2015) 'It's about time': applying life span and life course perspectives to the study of subjective age. *Annual Review of Gerontology and Geriatrics* **35**, 55–77.

Barrett AE and Toothman EL (2014) Baby boomers' subjective life course and its physical health effects: how distinctive is the 'forever young' cohort? *International Journal of Aging and Human Development* **79**, 109–129.

Bergland A, Nicolaisen M and Thorsen K (2014) Predictors of subjective age in people aged 40–79 years: a five-year follow-up study. The impact of mastery, mental and physical health. *Aging and Mental Health* **18**, 653–661.

Bordone V and Arpino B (2016) Do grandchildren influence how old you feel? *Journal of Aging and Health* **28**, 1055–1072.

Bordone V, Arpino B and Rosina A (2020) Forever young? An analysis of the factors influencing perceptions of ageing. *Ageing & Society* **40**, 1669–1693.

Bultena GL and Powers EA (1978) Denial of aging: age identification and reference group orientations. *Journal of Gerontology* **33**, 748–754.

Burn K and Szoeke C (2015) Is grandparenting a form of social engagement that benefits cognition in ageing? *Maturitas* **80**, 122–125.

Choi NG, DiNitto DM and Kim J (2014) Discrepancy between chronological age and felt age: age group difference in objective and subjective health as correlates. *Journal of Aging and Health* **26**, 458–473.

Chopik WJ, Bremner RH, Johnson DJ and Giasson HL (2018) Age differences in age perceptions and developmental transitions. *Frontiers in Psychology* **9**, 67.

Coleman JS (2008) *Foundations of Social Theory*. Beijing: Social Sciences Academic Press.

Cornwell B, Laumann EO and Schumm LP (2008) The social connectedness of older adults: a national profile. *American Sociological Review* **73**, 185–203.

Demakakos P, Gjonca E and Nazroo J (2007) Age identity, age perceptions, and health: evidence from the English Longitudinal Study of Aging. *Annals of the New York Academy of Sciences* **1114**, 279–287.

Diehl M, Wahl H-W, Brothers A and Miche M (2015) Subjective aging and awareness of aging: toward a new understanding of the aging self. *Annual Review of Gerontology and Geriatrics* **35**, 1–28.

Drevenstedt J (1976) Perceptions of onsets of young adulthood, middle age, and old age. *Journal of Gerontology* **31**, 53–57.

Elder GJ (1985) *Life Course Dynamics: Trajectories and Transitions 1968–1980*. Ithaca, NY: Cornell University Press.

Feng Z, Jones K and Wang W (2015) An exploratory discrete-time multilevel analysis of the effect of social support on the survival of elderly people in China. *Social Science and Medicine* **130**, 181–189.

Feng Z, Phillips DR and Jones K (2018) A geographical multivariable multilevel analysis of social exclusion among older people in China: evidence from the China Longitudinal Aging Social Survey ageing study. *Geographical Journal* **184**, 413–428.

Furstenberg AL (1989) Older people's age self-concept. *Social Casework Journal of Contemporary Social Work* **70**, 268–275.

George LK, Mutran EJ and Pennybacker MR (1980) The meaning and measurement of age identity. *Experimental Aging Research* **6**, 283–298.

Goode WJ (1960) A theory of role strain. *American Sociological Review* **25**, 483–496.

Hayslip Jr B, Blumenthal H and Garner A (2014) Health and grandparent–grandchild well-being: one-year longitudinal findings for custodial grandfamilies. *Journal of Aging and Health* **26**, 559–582.

Hinterlong JE, Morrow-Howell N and Rozario PA (2007) Productive engagement and late life physical and mental health – findings from a nationally representative panel study. *Research on Aging* **29**, 348–370.

Hu W (2009) Lei ji de yi zhi xing sheng ming li cheng shi jiao xia de lao nian ren fen hua [Cumulative heterogeneity: differentiation of older adults from the life-course perspective]. *Society* **29**, 112–130.

Hu J, Liu X, Dai X, Gui G and Kou X (2018) Wu han shi she qu kong chao lao ren she hui zhi chi, ying dui fang shi, zi wo xiao neng yu yi yu zhuang kuang de guan xi [Relationship between social support, coping style, self-efficacy and depression status of empty nest elderly in Wuhan community]. *Chinese Journal of Gerontology* **38**, 1508–1511.

Hubley AM and Hultsci DF (1994) The relationship of personality trait variables to subjective age identity in older adults. *Research on Aging* **16**, 415–439.

Hubley AM and Russell LB (2009) Prediction of subjective age, desired age, and age satisfaction in older adults: do some health dimensions contribute more than others? *International Journal of Behavioral Development* **33**, 12–21.

Kaufman G and Elder Jr GH (2002) Revisiting age identity: a research note. *Journal of Aging Studies* **16**, 169–176.

Kivnick HQ (1983) Dimensions of grandparenthood meaning – deductive conceptualization and empirical derivation. *Journal of Personality and Social Psychology* **44**, 1056–1068.

Knoll N, Rieckmann N, Scholz U and Schwarzer R (2004) Predictors of subjective age before and after cataract surgery: conscientiousness makes a difference. *Psychology and Aging* **19**, 676–688.

Levy BR, Ferrucci L, Zonderman AB, Slade MD, Troncoso J and Resnick SM (2016) A culture–brain link: negative age stereotypes predict Alzheimer's disease biomarkers. *Psychology and Aging* **31**, 82–88.

Liang K (2014) The cross-domain correlates of subjective age in Chinese oldest-old. *Aging and Mental Health* **18**, 217–224.

Liu H, Wu B and Feng Z (2020) Social participation and self-perception of being old in China. *International Journal of Aging and Human Development* **91**, 219–234.

Logan JR, Ward R and Spitze G (1992) As old as you feel: age identity in middle and later life. *Social Forces* **71**, 451–467.

Markides KS and Ray LA (1988) Change in subjective age among the elderly: an eight-year longitudinal study. *Comprehensive Gerontology* **2**, 11–15.

Mehta KK and Leng LT (2012) *Experiencing Grandparenthood: An Asian Perspective*. New York, NY: Springer.

Montepare JM (2009) Subjective age: toward a guiding lifespan framework. *International Journal of Behavioral Development* **33**, 42–46.

Morgan DL (1988) Age differences in social networks participation. *Journal of Gerontology: Social Sciences* **43**, S129–S137.

Mutran E and George LK (1982) Alternative methods of measuring role-identity – a research note. *Social Forces* **60**, 866–876.

Phillips DR and Feng Z (2015) Challenges for the aging family in the People's Republic of China. *Canadian Journal on Aging/La Revue canadienne du vieillissement* **34**, 290–304.

Rozario PA and Derienzis D (2009) 'So forget how old I am!' Examining age identities in the face of chronic conditions. *Sociology of Health and Illness* **31**, 540–553.

Rubin DC and Berntsen D (2006) People over forty feel 20% younger than their age: subjective age across the lifespan. *Psychonomic Bulletin and Review* **13**, 776–780.

Sanderson WC and Scherbov S (2010) Remeasuring aging. *Science* **329**, 1287–1288.

Sung KT (2001) Elder respect – exploration of ideals and forms in East Asia. *Journal of Aging Studies* **15**, 13–26.

United Nations (2019) *2019 Revision of World Population Prospects*. Available at https://population.un.org/wpp/.

Uotinen V, Suutama T and Ruoppila I (2003) Age identification in the framework of successful aging. A study of older Finnish people. *International Journal of Aging & Human Development* **56**, 173–195.

Ward RA (1977) Impact of subjective age and stigma on older persons. *Journal of Gerontology* **32**, 227–232.

Westerhof GJ and Barrett AE (2005) Age identity and subjective well-being: a comparison of the United States and Germany. *Journals of Gerontology: Psychological Sciences and Social Sciences* **60B**, S129–S136.

Wrzus C, Hanel M, Wagner J and Neyer FJ (2013) Social network changes and life events across the life span: a meta-analysis. *Psychological Bulletin* **139**, 53–80.

Yang J (2012) *Shu ju chu li yu mo xing fen xi: STATA ruan jian ying yong* [*Data Management and Model Analysis: Application of STATA Software*]. Beijing: China Renmin University Press.

Zeng Y and George L (2002) Extremely rapid ageing and the living arrangements of the elderly: the case of China. *Population Bulletin of the United Nations Special Issue* **42/43**(28), 255–287.

Cite this article: Liu H, Yang R, Feng Z (2022). Age-related loss of resources and perceived old age in China. *Ageing & Society* **42**, 1280–1298. https://doi.org/10.1017/S0144686X20001440