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Determinants of life satisfaction and self-perception of ageing among elderly people in China: An exploratory study in comparison between physical and social functioning

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ABSTRACT

Objective: This study attempted to figure out the difference between physical and social functioning in determining life satisfaction and self-perception of ageing among community-dwelling elderly people in China.
Methods: A representative random sample of 2161 participants aged 60 years or older was surveyed by face-to-face interview. Sociodemographic factors were measured by age, educational level, and marital status. Physical functioning was identified in terms of self-perceived health, basic and instrumental activities of daily living, and number of chronic illnesses. Social functioning was characterized in terms of number of people living together, social support network, and sense of loneliness. Hierarchical multiple linear regressions were performed to identify significant determinants of life satisfaction and self-perception of ageing.
Results: Older age and lower educational level were related to higher degree of life satisfaction; whereas younger age and higher educational level were related to higher level of self-perception of ageing. Social functioning took precedence over physical functioning in contributing to life satisfaction. In contrast, physical functioning outweighed social functioning in promoting a positive self-perception of ageing.
Conclusion: A sense of companionship and a supportive social network are vital in enhancing life satisfaction, whereas perceived physical health and functional independence are essential in facilitating a positive self-perception of ageing. Understanding the underlying determinants can provide a novel insight into the mechanism involved in achieving successful ageing.

1. Introduction

Ageing is an inevitable process for every individual. In order for later life to be a time that individuals can spend in a state of sustained health and vitality, and even contributing to society rather than merely a time of ill health and dependency, the idea of successful ageing has been promoted (Martin et al., 2015). Successful ageing has been traditionally defined by the presence of three interdependent factors: good physical health with a low risk of disease, high functional level, and active engagement with life in terms of close relationships with others and participation in society (Rowe & Kahn, 1987, 1998). In fact, the first two factors can be perceived as one's physical functioning whereas the last factor can be regarded as individual's social functioning.

However, a simple reduction of successful ageing to mere objective constructs including physical functioning and social functioning may not fully explain the essence of ageing well. Subjective value judgement or evaluations of one's ageing process or experience is also playing a significant role in understanding successful ageing (Martin et al., 2015; Pruchno, Wilson-Genderson, & Cartwright, 2010). In fact, a promising evaluation of or satisfaction with life as a whole is one of the crucial indicators of successful ageing (Bowling & Dieppe, 2005; Lee, 2009; Wiest, Schüz, & Wurm, 2013). Besides, elderly individuals who can think positively about themselves instead of accepting negative stereotyping are also more likely to achieve successful ageing (Bai & Chow, 2013). Thus, both life satisfaction and self-perception of ageing should not be overlooked when taking the subjective criteria of successful ageing into consideration.

A two-factor model of successful ageing has been proposed by including both objective and subjective components. The general structure of the model has also been tested (Pruchno et al., 2010). However, a detailed investigation of the directional effect between these two major components is lacking. Further study is needed to fill this

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research gap. Specifically, identifying the roles of underlying objective physical or social functioning in promoting subjective life satisfaction and self-perception of ageing should help us better understand the mechanism involved in successful ageing.

1.1. Life satisfaction

Ageing has been regarded as a process of physical, cognitive and social loss. Life satisfaction then plays a crucial role during the ageing process of experiencing loss. It has frequently been used as an indicator to assess older adults' well-being. Being a primary predictor of subjective well-being, life satisfaction always refers to a subjective evaluation of life as a whole (Diener & Diener, 1995). If their evaluations of the life condition are in line with their own expectations, individuals will report high life satisfaction (Kong & You, 2011). A higher level of life satisfaction among elderly people is associated with positive affect, better mental and physical condition, and more possibilities to achieve successful ageing (Bai, Yang, & Knapp, 2018).

1.2. Life satisfaction and physical functioning

Physical health or functioning is known to be the most significant predictor of life satisfaction in the elderly (Abu-Bader, Rogers, & Barusch, 2002; Meléndez, Tomas, Oliver, & Navarro, 2008). As such, physical functioning depends on the extent to which a person can live independently or how well an individual performs basic or instrumental activities of daily living (ADL) tasks (Depp & Jeste, 2006). Research showed that difficulty in performing ADL tasks can be associated with poor self-efficacy, high health care costs and service utilization, as well as diminished quality of life (Spillman, 2004). In addition, there is also substantial evidence relating perceived health to life satisfaction. Studies have shown that not only the chronic health problems (Meléndez et al., 2008) but also the subjective self-assessment of health can influence life satisfaction among the elderly (Borg, Hallberg, & Blomqvist, 2006; Gutierrez, Tomas, Galiana, Sancho, & Cebria, 2013).

1.3. Life satisfaction and social functioning

Undoubtedly, social support is also a major component in facilitating life satisfaction in the elderly (Adams et al., 2016; Gow, Pattie, Whiteman, Whalley, & Deary, 2007). Social support has been defined as "perceived or actual instrumental and/or expressive provisions supplied by the community, social networks, and confiding partners" (Lin, 1986). Researchers have studied social support from different viewpoints, including support network, content, direction, and self-perceived or actual-utilized support such as number of people living together (Adamczyk & Segrin, 2015; Bai et al., 2018; Hombrados-Mendieta, Garcia-Martin, & Gomez-Jacinto, 2013). Social relations research has also shown that social relations, whether conceptualized in terms of social support, social network, social ties, or positive social relations, are important predictors of subjective well-being and life satisfaction for older adults (Gow et al., 2007; Macia, Duboz, Montepare, & Gueye, 2015). In addition, researchers have also indicated that receiving support from family, friends and significant others can lead to promoting life satisfaction for older adults through the mediating effect on sense of loneliness (Adamczyk & Segrin, 2015; Bai et al., 2018).

1.4. Research gap in predictors of life satisfaction

Life satisfaction has been perceived as one of the criteria for successful ageing shared by both Chinese and Western culture (Ji, Ling, & McCarthy, 2015). A growing number of studies have examined the life satisfaction of elderly people in a context of Chinese culture. Specifically, functioning and health factors have been found to affect life satisfaction among Chinese elderly people (Chen & Silverstein, 2000; Li & Liang, 2007; Silverstein, Cong, & Li, 2006). On the other hand, social support and social exchange, especially from and with family members, also play a crucial role in affecting their life satisfaction (Li & Liang, 2007; Silverstein et al., 2006). As such, the mixed findings shown above pertinent to physical functioning or social functioning might imply the endorsement of underlying individualistic and collectivistic values, respectively, which leads to opposing cultural approaches towards life satisfaction (Wai Li & Hamamura, 2010). Thus, further investigation in this study should fill up a research gap by laying an important groundwork, so as to verify the relative importance of physical functioning or social functioning as determinants of life satisfaction in a Chinese context. It is hypothesized that social functioning should surpass physical functioning in promoting life satisfaction in a Chinese context due to the underlying collectivistic cultural beliefs.

1.5. Self-perception of ageing

In order to have better adaptations to changes in later years despite of objective circumstances, a positive self-perception of ageing is essential (Levy, Slade, & Kasl, 2002). Self-perception of ageing has been used interchangeably with "self-image of ageing", "ageing identity", or "self-stereotypes of ageing" in different literatures (Bai & Chow, 2013; Jang, Poon, Kim, & Shin, 2004; Levy et al., 2002; Tovel, Carmel, & Raveis, 2019). A positive self-perception of ageing should be beneficial for both physical and mental well-being (Maier & Smith, 1999) and is even a protective factor in physical functioning in old age (Sargent-Cox, Anstey, & Luszcz, 2012). Alternatively, having a negative self-perception of ageing can have detrimental effects on older people's physical, mental, behavioural and social functioning (Bai, 2014). Nevertheless, studies about the reciprocal relationship between physical functioning or social functioning and self-perception of ageing were also indicated as follows.

1.6. Self-perception of ageing and physical functioning

On one hand, physical functioning in terms of performance in basic and instrumental ADL tasks has been shown to have a strong association with self-perception of ageing (Moser, Spagnoli, & Santos-Eggimann, 2011). On the other hand, health-related factors are also among the possible determinants of self-perception of ageing. Physical health conditions, such as chronic diseases or functional disability, may have an underlying influence on older individuals' perception or evaluation of the ageing process (Jang et al., 2004). For example, having a history of chronic illness can influence older adults' present-day identity (Hannum, Black, Rubinstein, & de Medeiros, 2017). From this perspective, it seems that physical functioning in terms of independence level or health status appears playing significant roles in affecting self-perception of ageing.

1.7. Self-perception of ageing and social functioning

Alternatively, social or emotional elements also play a considerable role in determining self-perception of ageing. Researchers have indicated that older adults who have a larger social network (Kim, Jang, & Chiriboga, 2012) and greater satisfaction with their social support (Lamont, Nelis, Quinn, & Clare, 2017) may feel more positive about their ageing process and have a more favourable attitude towards their personal ageing. Yet, Cheng (2017) recently showed that self-perception of ageing was unrelated to satisfaction with support. Thus, the inconclusive findings about the relationship between social functioning and self-perception of ageing is warranted for further investigation.

1.8. Research gap in predictors of self-perception of ageing

Self-perception of ageing in terms of stereotypes are common in both Western and Eastern cultures (Bai, Lai, & Guo, 2016; North &

Fiske, 2015). The traditional Chinese culture upholds the value of respecting the old and filial piety (Mjelde-Mossey, Chi, & Lou, 2005; Wang, Laidlaw, Power, & Shen, 2009), thus leading to the assumption that Chinese elderly people should experience less negative stereotypes (Tsai & Lopez, 1997). However, impacted by the trends of modernization, urbanization, and changes of family structure in China (Wang et al., 2009), the authority of Chinese elderly people in their families is declining (Ng, Phillips, & Lee, 2002), and this is leading to a rapid deterioration in self-perception and life dissatisfaction (Barak, Mathur, Lee, & Zhang, 2001). In light of the above mixed findings regarding the contributing roles of physical functioning or social functioning, it is paramount to identify the key element that lead to a positive self-perception of ageing so as to fill up the research gap. It has been suggested that overcoming negative stereotypes of ageing through changes at the individual level may help to promote more successful ageing (Bryant et al., 2012). Thus, it is hypothesized that physical functioning in terms of high independent level and better health status should be more important than social functioning in facilitating a positive self-perception of ageing.

1.9. Aims of the present research

Rowe and Kahn's model has highlighted the objective criteria in terms of physical functioning and social functioning in contributing to successful ageing (Rowe & Kahn, 1987, 1998). As illustrated from the above findings, physical functioning can be represented by individuals' performance in basic and instrumental ADL as well as health status in terms of self-perceived physical health and number of chronic illnesses. On the other hand, social functioning can be signified by sense of loneliness as well as degree of social support including social support network or number of people living together. However, the subjective components of ageing successfully such as the perception or evaluation of own ageing experience (Montross et al., 2006; Phelan & Larson, 2002) are ignored in the model. Specifically along this dimension, life satisfaction or self-perception of ageing are typical subjective indicators of ageing well.

Despite a two-factor model of successful ageing has been purported (Pruchno et al., 2010), not much in-depth investigation has been done in the directional relationship between both objective and subjective components of successful ageing. There is also an important research gap how far can the objective criteria contribute to the subjective evaluation of successful ageing. The mixed results shown above may also lead to a lack of clarity regarding the relative importance of physical functioning and social functioning in promoting life satisfaction or a positive self-perception of ageing.

Discovering the extent of the association of the two functioning factors with life satisfaction or self-perception of ageing should provide a novel insight into the mechanism involved in achieving successful ageing. The present exploratory study aims to clarify the importance of physical functioning and social functioning in determining life satisfaction and self-perception of ageing among community-dwelling elderly people in a Chinese context. According to the above literature review, the following specific hypotheses are developed:

(i) Social functioning should take precedence over physical functioning in contributing life satisfaction among elderly people
(ii) Physical functioning should prevail over social functioning in promoting self-perception of ageing among elderly people

It is hoped that this research can provide more empirical findings that will facilitate the enhancement of successful ageing for Chinese elderly people living in the community.

2. Materials and methods

2.1. Participants

This research was a cross-sectional survey of elderly people living in the Fangshan district of Beijing Municipality in China. As a whole, there are eight subdistricts in Fangshan district. Through a cluster sampling method, participants were randomly selected from four subdistricts, in which a sample consisting of 2161 community-dwelling Chinese elderly aged 60 or above was selected from 30 small communities within these four subdistricts. We trained 60 interviewers to conduct face-to-face interviews with the selected elderly people at their homes. The interviewers possessed at least a master's degree in social work and had experience of conducting interviews. Prior to the actual fieldwork, all interviewers received centralized training that provided a thorough explanation of the contents of the survey questionnaire and the relevant precautions to be taken during the interviews. Informed consent was obtained prior to conducting the interview.

To ensure the fidelity of the entire evaluation process, all the interviews made by the interviewers were recorded. Random inspections for quality checks were conducted by our research project team. At the investigation site, our research project team also conducted patrol inspections to guide the work of the interviewers and promptly answered and dealt with questions raised by them. In addition, each interviewer conducted a self-examination and a mutual investigation of the completed questionnaires to check for any errors or omissions. If a problematic questionnaire was found, immediate contact and follow-up actions were taken.

Table 1 illustrates the demographic characteristics of the participants. Of the 2161 elderly people who participated in the study, more than half (52.6%) were female, 42% were within the age range of 70–79 years, more than two thirds (67.1%) were married or engaged, and more than half (51.1%) had received a secondary level education. By use of the cluster sampling method, it is just assumed that each subdistrict or cluster per se is a fair representation of the population, so it should imply heterogeneous characteristics among different clusters. As can be seen in Table 1, there were significant gender differences in the demographic factors: A higher proportion of male participants were in the older age range and were either married or engaged, and more male participants had a relatively higher educational level. It can reflect a historical phenomenon in China in which educational attainment was less emphasized among several cohorts of women who were born between 1945 and 1968 (Piotrowski & Tong, 2016). There were also some gender differences in some of the measured variables, including SIAS-C, self-perceived health, number of chronic illnesses, and number of people living together. Specifically, the male participants had a better self-perception of ageing, with better self-perceived health, a smaller number of chronic illnesses, and a greater number of people living together, than their female counterparts. However, the effect sizes of the gender differences of those variables were relatively small (Cohen's $d = 0.12$ to 0.19). Thus, the male and female elderly participants were analysed together in this study.

2.2. Measures

The following assessment scales, which were incorporated into one survey questionnaire, were administered to all the participants; for those assessments without a Chinese version, translation and cultural adaptations were made with reference to the guidelines for the translation and adaptation of psychometric scales (Wild et al., 2005). Regarding the subjective dimensions of successful ageing, both life satisfaction and self-perception of ageing were measured by the corresponding validated scales. Measurements of two objective constructs of successful ageing were carried out by different corresponding scales. Specifically, the evaluation of physical functioning includes basic and instrumental activities of daily living, self-rated physical

Table 1
Demographic profile and detailed description of different measures of the participants.

	Male n = 1024	Female n = 1137	Total n = 2161	
	Number (%)	Number (%)	Number (%)	*chi-square test value*
Age				
60-69	206 (20.1)	236 (20.8)	442 (20.4)	9.532*
70-79	400 (39.1)	507 (44.5)	907 (42.0)	
80-89	393 (38.4)	369 (32.5)	762 (35.3)	
90 or above	25 (2.4)	25 (2.2)	50 (2.3)	
Marital status				
Married or engaged	848 (82.8)	601 (53.5)	1449 (67.1)	226.23***
Single or divorced	162 (15.8)	522 (46.5)	684 (31.6)	
Missing	14 (1.4)	14 (1.2)	28 (1.3)	
Educational level				
Illiterate or below primary	45 (4.4)	182 (16.0)	227 (10.5)	158.75***
Primary	183 (17.9)	341 (30.0)	524 (24.3)	
Junior secondary	359 (35.1)	303 (26.6)	662 (30.6)	
Senior secondary	241 (23.5)	202 (17.8)	443 (20.5)	
Tertiary or above	195 (19.0)	107 (9.4)	302 (14.0)	
Missing	1 (0.1)	2 (0.2)	3 (0.1)	
	Mean (SD)	Mean (SD)	Mean (SD)	*t-test value*
SWLS	20.38 (4.14)	20.18 (4.46)	20.28 (4.31)	1.055
SIAS-C	53.81 (8.89)	52.29 (9.13)	53.01 (9.05)	3.907***
Self-perceived health	3.12 (.84)	2.98 (.89)	3.05 (.87)	3.58***
ADLH	.27 (.10)	.27 (.96)	.27 (.98)	−.022
IADLP	6.81 (13.78)	7.07 (13.50)	6.95 (13.63)	−.450
Number of chronic illnesses	3.71 (2.55)	4.2 (2.46)	3.97 (2.52)	−4.57***
Loneliness scale	1.08 (1.14)	.99 (1.06)	1.03 (1.10)	1.872
LSNS	29.56 (8.57)	29.87 (8.83)	29.72 (8.71)	−.836
People living together	2.25 (.94)	2.12 (1.19)	2.18 (1.08)	2.709**

Note: * < 0.05; ** < 0.01; *** < 0.001; SWLS = Satisfaction With Life Scale; SIAS-C = Chinese version of the Self-Image of Ageing Scale; ADLH = Activities of Daily Living Hierarchy scale; IADLP = Instrumental Activities of Daily Living Performance scale; LSNS = Lubben Social Network Scale.

health, as well as number of chronic illnesses. With regard to the social functioning, it was assessed by sense of loneliness, social support network, and number of people living together. Corresponding measured variables representing physical functioning and social functioning were chosen according to the literature review identified above.

2.2.1. Life satisfaction

This was measured by the Satisfaction With Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985). The SWLS is a short 5-item instrument designed to measure global cognitive judgments of satisfaction with one's life. It is rated on a 5-point Likert scale (Kobau, Sniezek, Zack, Lucas, & Burns, 2010). An example item is "I am satisfied with my life". In our sample, the Cronbach's alpha of the SWLS was 0.86. A higher total score indicates higher life satisfaction.

2.2.2. Self-perception of ageing

This was measured by the Chinese version of the Self-Image of Ageing Scale (SIAS-C; Bai, Chan, & Chow, 2012). The SIAS-C is a 14-item scale used to examine how older adults perceive themselves in five domains: general physical health, social virtues, life attitudes, psychosocial status, and cognition. It is rated on a 5-point Likert scale. An example item is "I have a positive outlook". In our sample, the Cronbach's alpha of the SIAS-C was 0.77 for the overall score and ranged from 0.57 to 0.65 for the subscales. A higher total score indicates a more positive self-perception of ageing.

2.2.3. Basic activities of daily living (BADL)

This was measured by the International Residential Assessment Instrument (interRAI) Activities of Daily Living Hierarchy scale (ADLH; Hirdes et al., 2008; Morris, Fries, & Morris, 1999). The ADLH is a 7-item scale used to measure dependency level in performing across a spectrum of activities of daily living, such as dressing, grooming, and bathing. It is rated on a 7-point Likert scale. In our sample, the Cronbach's alpha of ADLH was 0.956. A higher total score indicates a higher dependency level in performing BADL.

2.2.4. Instrumental activities of daily living (IADL)

This was measured by the interRAI Instrumental Activities of Daily Living Performance scale (IADLP; Hirdes et al., 2008; Landi et al., 2000). The IADLP is an 8-item scale used to measure the difficulty level in performing IADL. It is rated on a 7-point Likert scale. The Cronbach's alpha of IADLP was 0.955 in our sample. A higher total score indicates a higher level of difficulty in performing IADL.

2.2.5. Self-perceived health

This was assessed on a 5-point scale by a single question: "How would you rate your perceived physical health?" A higher score indicates better self-perceived physical health.

2.2.6. Number of chronic illnesses

This was measured by a multiple-choice question: "How many chronic illnesses do you have?" Participants were asked whether they had any of the following 16 chronic illnesses: hypertension, heart disease, cerebrovascular disease, Parkinson's disease, dementia, abdominal ulcer, liver disease, kidney disease, diabetes mellitus, rheumatoid arthritis, spine problem, osteoporosis, respiratory problem, cataract, cancer, or prostatitis. A higher score indicates a higher number of chronic illnesses.

2.2.7. Sense of loneliness

This was measured by the Chinese version of the De Jong Gierveld Loneliness Scale (Leung, de Jong Gierveld, & Lam, 2008). The scale is a 6-item scale used to measure overall, emotional and social loneliness. It is rated on a 3-point Likert scale. An example item is "I experience a general sense of emptiness". The Cronbach's alpha of the overall score was 0.669 in our sample. A higher score indicates severe sense of loneliness.

2.2.8. Social support network

This was assessed by the Lubben Social Network Scale (LSNS; Lubben, 1988). The LSNS is a 10-item scale, and it was developed for use among older adult populations to assess social networks and social support. It is rated on a 6-point Likert scale. An example item is "How many relatives do you see or hear from at least once a month?" The Cronbach's alpha of the overall score was 0.699 in our sample. A higher score indicates higher social support.

2.2.9. Number of people living together

This was assessed by a single question: "How many people are living together with you?" A higher score indicates a higher number of people living together.

2.3. Statistical analysis

The data were analysed using the Statistical Package for the Social Sciences (SPSS, version 24.0). First, chi-square and t tests were conducted to compare gender differences in demographic factors and various outcome measures. Hierarchical multiple linear regressions were performed to identify significant determinants of life satisfaction and self-perception of ageing. We entered the demographic factors,

Table 2
Hierarchical regression analysis of factors contributing to life satisfaction in elderly participants.

	B	SE	β	t	R^2	R^2 change
Model 1: Sociodemographic factors					.033	.033***
Age	.10	.01	.17	7.43***		
Married / engaged	.87	.20	.10	4.42***		
Educational level	−.20	.08	−.06	−2.61**		
Model 2: Physical functioning					.104	.071***
Perceived health	.90	.11	.20	7.90***		
IADLP	−.01	.01	−.03	−.85		
ADLH	.11	.15	.02	.75		
Chronic illness	−.18	.04	−.11	−4.68***		
Model 3: Social functioning					.216	.111***
People together#	−.06	.08	−.02	−.82		
LSNS	.02	.01	.05	2.00*		
Loneliness	−1.18	.08	−.33	−15.80***		

Note: #people living together; *p < .05; **p < .01; ***p < .001; ADLH = Activities of Daily Living Hierarchy scale; IADLP = Instrumental Activities of Daily Living Performance scale; LSNS = Lubben Social Network Scale.

Table 3
Hierarchical regression analysis of factors contributing to self-perception of ageing in elderly participants.

	B	SE	β	t	R^2	R^2 change
Model 1: Sociodemographic factors					.074	.074***
Age	−.15	.03	−.12	−5.54***		
Married / engaged	2.98	.39	.17	7.59***		
Educational level	.56	.15	.08	3.78**		
Model 2: Physical functioning					.379	.305***
Perceived health	2.91	.19	.31	15.18***		
IADLP	−.18	.02	−.27	−10.34***		
ADLH	.25	.25	.02	.98		
Chronic illness	−.56	.06	−.18	−8.95***		
Model 3: Social functioning					.453	.074***
People together#	.23	.13	.03	1.79		
LSNS	.15	.02	.16	8.12***		
Loneliness	−1.45	.13	−.20	−11.46***		

Note: #people living together; *p < .05; **p < .01; ***p < .001; ADLH = Activities of Daily Living Hierarchy scale; IADLP = Instrumental Activities of Daily Living Performance scale; LSNS = Lubben Social Network Scale.

including age, marital status, and educational level, in the first step; physical functioning, including perceived health, BADL, IADL, and number of chronic illnesses, in the second step; and social functioning, including sense of loneliness, social support network, and number of people living together, in the final step.

3. Results

3.1. Determinants of life satisfaction

Table 2 shows the results of the hierarchical multiple linear regressions model with regard to life satisfaction. Sociodemographic factors were entered into the first step and explained 3.3% of the variance in life satisfaction. Specifically, participants who were older, more engaged (married or cohabiting), or had a lower educational level had a higher level of life satisfaction. After entry of physical functioning at the second step, it explained an additional 7.1% of the variance in life satisfaction, after controlling for sociodemographic factors. In the final model, social functioning was entered and explained with a further additional 11.1% of the variance in life satisfaction after controlling for both sociodemographic factors and physical functioning. The unique variance shown by respective objective construct demonstrated that social functioning appears more important than physical functioning in promoting life satisfaction among elderly.

With regard to social functioning, the results suggest that sense of loneliness is the most significant factor (Beta = -0.328, t = -15.8, p < .001) (i.e., less loneliness leads to a higher level of life satisfaction). Social support network is also important but to a lesser degree (Beta = .047, t = 1.995, p < .05) (i.e., a larger social support network should also result in a higher level of life satisfaction). However, the number of people living together is an insignificant factor in contributing to social functioning.

With regard to physical functioning, the results suggest that perceived health (Beta = .196, t = 7.9, p < .001) and the number of chronic illnesses (Beta = -0.110, t = -4.68, p < .001) are the most significant factors (i.e., higher self-perceived physical health with a smaller number of chronic illnesses should lead to a higher level of life satisfaction). However, both IADL and BADL are insignificant factors in causing physical functioning.

3.2. Determinants of self-perception of ageing

Table 3 depicts the results of the hierarchical multiple linear regressions model with regard to self-perception of ageing. Sociodemographic factors were entered into the first step and explained 7.4% of the variance in self-perception of ageing. Specifically, participants who were younger in age, more engaged (married or cohabiting), or had a higher educational level had a more positive self-perception of ageing. After entry of physical functioning at the second step, it explained an additional 30.5% of the variance in self-perception of ageing, after controlling for sociodemographic factors. In the final model, social functioning was entered and explained with a further additional 7.4% only of the variance in life satisfaction after controlling for both sociodemographic factors and physical functioning. The unique variance shown by respective objective construct demonstrated that physical functioning appears far more essential than social functioning in advancing self-perception of ageing among elderly.

Regarding physical functioning, the results suggest that perceived health (Beta = .314, t = 15.184, p < .001) is the most significant factor, followed by IADL (Beta = −.268, t = -0.268, p < .001) and then number of chronic illnesses (Beta = −.175, t = −8.947, p < .001) (i.e., higher self-perceived physical health, being more independent in performing IADL, and having a smaller number of chronic illnesses should lead to a more positive self-perception of ageing). However, BADL is an insignificant factor in affecting physical functioning.

Regarding social functioning, the results suggest that sense of loneliness is the most significant factor (Beta = -0.199, t = −11.46, p < .001) (i.e., less loneliness leads to a higher level of self-perception of ageing). Social support network is another significant factor (Beta = .160, t = 8.124, p < .001) (i.e., a larger social support network should also result in a more positive self-perception of ageing). However, the number of people living together is an insignificant factor in producing social functioning.

4. Discussion

By examining the effects of both physical functioning and social functioning on life satisfaction and self-perception of ageing, this study can enrich the two-factor model of successful ageing (Pruchno et al., 2010) in linking up the directional relationship of objective criteria and subjective constructs. It shows that social functioning is more important than physical functioning in promoting life satisfaction among the elderly, whereas physical functioning is more imperative than social functioning in predicting self-perception of ageing. Therefore, our two hypotheses are supported in this study.

4.1. Life satisfaction and its determinants

Regarding the relationship between sociodemographic factors and life satisfaction, findings from the present study show that older individuals have a higher level of life satisfaction than their younger counterparts. This is compatible with a phenomenon known as the paradox of ageing (Mather, 2012; Zhou, Lu, Chen, Dong, & Yao, 2017). During the ageing process, older adults tend to react less to negative situations, ignore irrelevant negative stimuli better, and remember relatively more positive information than negative information (Mather, 2012); they can even derive more emotional satisfaction from prioritizing positive information processing (Zhou et al., 2017). Thus, older individuals manage to maintain positive well-being, and this leads to a higher sense of life satisfaction. Recently, a research finding indicated an age effect of frames of reference in reporting life satisfaction (Filus, Junghaenel, Schneider, Broderick, & Stone, 2018), showing that older adults tend to use less interpersonal comparisons than younger respondents when self-rating their life satisfaction. As the present research focuses only on elderly people aged 60 or above, perhaps the current findings can extend the application of frames of references to the elderly group comprising young-old and old-old individuals.

In general, educational level is positively related to life satisfaction, as shown in the literature (e.g., Meléndez et al., 2008; Yang, Lee, Huang, Shih, & Chang, 2015). A possible mechanism that links education to job satisfaction and further to life satisfaction should help to explain this positive relationship (Heller, Watson, & Ilies, 2004; Ilies, Yao, Curseu, & Liang, 2018). It means those who are more educated would find and hold jobs that fit better with their skills and abilities, which makes them more satisfied with their life. However, only a significant negative relationship between education and life satisfaction was found in the current study. The contrasting findings may imply that the focus on the work domain in relation to life satisfaction may not be applicable to the elderly participants in the present study. In addition, the findings from the current study should echo well with the “progress paradox” phenomenon in China. A recent Chinese livelihood survey indicated that urban and educated respondents are more likely to report depression, while rural and uneducated respondents are more satisfied with their lives and less likely to report poor mental health (Graham, Zhou, & Zhang, 2017). Perhaps this reflects that individuals with a lower educational level may be easily satisfied with their current simple living conditions, whereas elderly people with a higher educational level may still have some unsatisfied needs in their life.

Among elderly people, it seems that social functioning takes precedence over physical functioning in promoting life satisfaction. In other words, a supportive social network and a sense of companionship should be more important than the physical health or independence level in contributing to gratification in life among elderly people. This matches well with the collectivistic values in Chinese culture (Wai Li & Hamamura, 2010). For the participants in this study, within the social functioning domains that are related to life satisfaction, sense of loneliness was the factor that contributed most to life satisfaction. Loneliness is a subjective feeling of isolation, not belonging, or lacking companionship. It can be explained as the gap between one’s desired relationships and one’s actual relationships (Perissinotto, Cenzer, & Covinsky, 2012; Tomstad, Dale, Sundsli, Sævareid, & Söderhamn, 2017). Thus, loneliness can be distinct from several quantitative measures of social isolation, such as number of relationships. For example, it is possible for persons to live alone but not feel lonely, while some live with others yet still experience loneliness. Some elderly people may be satisfied with solitude (Dale, Söderhamn, & Söderhamn, 2012), and some individuals even report experiencing solitude as a sense of freedom (Taube, Jakobsson, Midlöv, & Kristensson, 2016). This can help to explain why number of people living together was insignificant in contributing to social functioning in the present study. In fact, feeling lonely may involve living with losses in terms of suffering deteriorating physical health or missing significant others, or even with the loss of a meaningful life (Graneheim & Lundman, 2010). Such a subjective perception of loneliness may not be explained by the actual number of people living together.

After all, a social support network still plays a significant role in life satisfaction. This is consistent with the existing robust literature (e.g., Adams et al., 2016; Berg, Hassing, McClearn, & Johansson, 2006; Cheng & Chan, 2006; Zhu, Hu, & Efird, 2012), which indicates that individuals with higher levels of perceived social support have higher levels of life satisfaction. Perhaps this can be explained by the socioemotional selectivity theory (Carstensen, 1992), which postulates that as people move towards older adulthood, they pursue meaningful and close relationships when they are increasingly aware that their remaining time is limited. In addition, according to the stress-buffering hypothesis model (Cohen & Wills, 1985), social support can also buffer the adverse impact of depressive symptoms on life satisfaction among older people (Adams et al., 2016). In fact, social support has been shown to mediate loneliness and depression in elderly people (Liu, Gou, & Zuo, 2016; Zhao et al., 2018).

4.2. Self-perception of ageing and its determinants

With regard to the relationship between sociodemographic factors and self-perception of ageing, the findings from the present study show that older individuals have a more negative self-perception of ageing than their younger counterparts. In fact, the negative age stereotypes associated with older people (e.g., lonely, incompetent, unattractive) increase with age (Kite, Stockdale, Whitley, & Johnson, 2005; Weiss, Sassenberg, & Freund, 2013). This can result from the decline in physiological and cognitive functions in the elderly (Levy, 2009). Perhaps some observable ageing-related cues, such as the losing or greying of hair and changes in skin texture and pigmentation, may further internalize a negative self-perception of ageing (Aznar-Casanova, Torro-Alves, & Fukusima, 2010). In a comparative study, the findings showed that old-old adults have a more negative bias in the physical domain compared to young-old adults (Davis & Friedrich, 2010).

In addition, the findings from this study confirmed that elderly people with a higher educational level should have a more positive self-perception of ageing. This finding is compatible with previous studies depicting the relationship between education and ageing identities (Isopahkala-Bouret, 2015; Wilinska, 2012) in which elderly people used lifelong learning or educational attainment as a practice to resist against age stereotypes. Through lifelong learning, they can differentiate themselves from the stereotype of physical and mental decline. They can construct the meaning of ageing in relation to their own educational status, and this leads to a more positive self-perception of ageing (e.g., generative, accumulated experiences, wise) (Isopahkala-Bouret, 2015). Consistent with the idea of active ageing, elderly people are encouraged to maintain intellectual curiosity and to engage in continuing learning activities until later life (Isopahkala-Bouret, 2014). Thus, it is no wonder lifelong learning is always perceived as a viable means of promoting successful ageing (Fernández-Ballesteros et al., 2013; Narushima, Liu, & Diestelkamp, 2018; Narushima, Liu, & Diestelkamp, 2013).

Among elderly individuals, physical functioning outweighs social functioning in facilitating a positive self-perception of ageing. Particularly, perceived physical health and independence level are more essential than a supportive social network or a sense of companionship in influencing elderly individuals’ self-perception of ageing. Within the physical functioning domains that are related to self-perception of ageing, perceived health was the most significant contributing factor. Perhaps attitudes towards personal ageing can be operationalized in terms of identity process theory (Whitbourne, 1986), which proposes that the process of identity assimilation (i.e., maintain a consistent view of the self) would be utilized by individuals who approach age-related changes in physical functioning. Therefore, better perceived physical health can undoubtedly lead to a positive self-

perception of ageing. In addition, a smaller number of chronic illnesses can also indicate better perceived physical health, as demonstrated in the present study. Alternatively, there is also a reciprocal relationship between self or age stereotypes and perceived health (Levy, 2009). A recent study showed that positive age stereotypes are associated with better physical health outcomes among older individuals: for example, more positive age stereotypes can act as a stress buffer when measured longitudinally by cortisol levels (Levy, Moffat, Resnick, Slade, & Ferrucci, 2016). In fact, a positive self-perception of ageing may be a protective factor against decline in physical functioning in late life (Sargent-Cox et al., 2012). Further investigation of the direction of the association between health and self-perception of ageing is implied.

On the other hand, independence level in terms of instrumental ADL also plays a vital role in contributing to an elderly person's self-perception of ageing. Findings from the present study are consistent with previous research indicating independence as a basis for personal identity (Wiles, Leibing, Guberman, Reeve, & Allen, 2012) and self-perception of ageing (Moser et al., 2011). In fact, older individuals' day-to-day experiences of functional limitations are related to concurrent negative self or age stereotypes (Allen, Mejía, & Hooker, 2015). This echoes with Levy's (2003) explanation of age-related biases in relation to the disease and disablement processes associated with ageing. Dependence is one of the manifestations of negative age stereotypes (Weiss et al., 2013) or disability (Stone, 2003). Striving for independence is thus an imperative pathway to enhance a positive self-perception of ageing.

4.3. Practical implication

Elderly people may have various ranges of life satisfaction and self-perception of ageing with regard to their age or educational level. For instance, younger individuals with higher educational level would have a lower degree of life satisfaction; whereas older counterparts with lower educational level would lead to a lower level of self-perception of ageing. Successful ageing can be promoted by focusing on these two major pathways in terms of life satisfaction or self-perception of ageing. For those elderly people who have a relative lower degree of life satisfaction, enhancing a sense of companionship and strengthening a supportive social network should be a good antidote for countering the dissatisfaction in life. For example, the participation in an elderly community centre may be a good opportunity to reduce a sense of loneliness and also increase networking with other buddies. On the other hand, for those elderly people who have a tendency of having a lower level of self-perception of ageing, improving the functional independence with enhanced physical health would be the goal of boosting up the self-image of ageing. Perhaps doing exercise can be considered as a means in achieving a better physical health (McHugh & Lawlor, 2013), and ultimately lead to a successful ageing via a healthier self-perception of ageing.

5. Limitations and conclusions

There are some limitations of this study. First, it was conducted only in one small region in China. Further replication in other areas, including rural and urban regions of China, is needed as there could be significant differences among elderly people living in different kinds of areas (Guo, Bai, & Feng, 2018; Zhang & Crimmins, 2019). Second, only cross-sectional correlation statistics were utilized in this study; thus, no definitive statement on causality can be made. Further longitudinal research is needed to achieve an understanding of the directionality. Third, the data were obtained exclusively through self-reports from the elderly participants. Future research could use a mixed-method design including observational data and reports from family members. Fourth, this study only focused on one seminal definition of successful ageing which includes physical or social aspects only (Rowe & Kahn, 1987, 1998) but lack of consideration of psychological components. As such, psychological functioning or mental health has long been emphasized as one of the determinants of life satisfaction (Liu & Guo, 2008; Pinto, Fontaine, & Neri, 2016). A more comprehensive model including the psychological perspective or even with the inclusion of death and dying (Martin et al., 2015) should be emphasized in future studies. Despite these limitations, this study adds to the literature by investigating the corresponding determinants of life satisfaction and self-perception of ageing. Specifically, a sense of companionship and a supportive social network are vital in enhancing life satisfaction, whereas perceived physical health and functional independence are essential in facilitating a positive self-perception of ageing. This study provides empirical support to improve understanding of the primary mechanism of achieving successful ageing. It also helps to enhance the two-factor model of successful ageing (Pruchno et al., 2010) by connecting both objective and subjective constructs together. According to the seminal definition (Rowe & Kahn, 1987, 1998), good physical health and functioning as well as favourable supportive social relationship are interdependent factors contributing to successful ageing. Findings from this study revealed that they may lead to successful ageing by working on different pathways through two subjective conditions including self-perception of ageing and life satisfaction, respectively. In other words, self-perception of ageing may serve as a crucial mediator between physical functioning and successful ageing, whereas life satisfaction as an imperative mediator between social functioning and successful ageing. Further investigation of the corresponding mediation or moderation effect through a longitudinal study is warranted. Moreover, it should lay important groundwork for future tailored-made interventions for promoting successful ageing.

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