

Subjective Cognitive Impairment of Older Adults: A Comparison between the US and China

Introduction

It has been well established that different reporting styles are a pernicious problem in cross cultural comparisons of subjective ratings (Hopkins & King, 2010). While previous research has provided evidence that a direct comparison could be very misleading in areas like political efficacy and self rated disability (Kapteyn, Smith, & Soest, 2007; King, Murray, Salomon, & Tandon, 2004), not much is known about self rated cognitive impairment.

In recent years, researchers are arguing the utility of subjective cognitive impairment as part of a diagnostic tool of cognitive disorder (Buckley et al., 2013; Jessen, Wiese, Bachmann, & et al., 2010). The correspondence between subjective memory and objective memory may vary across groups (Crumley, Stetler, & Horhota, 2014). Given the differences in general health care conditions and also varying response styles (Harzing, 2006), it is interesting to examine how the Chinese and the US older adults may differ in their reporting styles of subjective cognitive impairment and how the reporting styles may affect a direct comparison between older adults from the US and China. If indeed a notable difference in reporting styles is observed across countries, the utility of subjective cognitive impairment should take into account the specific reporting styles of the respective cultural groups.

Anchoring vignettes are a possible design to address reporting heterogeneity (King et al., 2004). Anchoring vignettes are descriptions of hypothetical cases characterized by the most salient objective aspects of a person or a situation. For example, the following is an anchoring vignette item used in a sub-study of the Health and Retirement Study (HRS). *“Lisa can concentrate while watching TV, reading a magazine or playing a game of cards or chess. Once a week she forgets where her keys or glasses are, but finds them within five minutes. Overall, in the last 30 days, how much difficulty did Lisa have with concentrating or remembering things?”* Options are given from 1 (None), Mild (2), Moderate (3), Severe (4), and Extreme (5).

Purpose

The current study explores how a number of key demographic factors including age, gender and education may affect reporting behaviors when evaluating cognitive impairment, with a particular interest in how respondents from China and the US would respond to the same three anchoring vignettes in different ways. Furthermore, the study evaluated whether adjusting reporting heterogeneity based on anchoring vignettes would bring the results from subjective ratings closer to findings from directly assessed memories. Although directly assessed memories are not perfect measures of objective cognitive function, this still provides an invaluable opportunity to validate anchoring vignettes, as an objective counterpart is usually non-existent in studies using anchoring vignettes.

Method

Data are from the Health and Retirement Study (HRS) in the US, and the China Health and Retirement Longitudinal Study (CHARLS) in China. HRS administered the 2007 Disability Vignette Survey (DVS) as its substudy. The current analysis focused on all respondents aged 50+ who had valid data from the self-rated cognitive impairment question (“Overall, in the last 30 days, how much difficulty did you have with concentrating or remembering things?”). A subsample of respondents from both countries also answered the anchoring vignettes items. The final analytical sample included 2,862 respondents from China, among whom 890 respondents also completed the three anchoring vignettes ratings. Another 4,408 were from the US sample, among whom 2,215 respondents provided ratings on anchoring vignettes. Note that the DVS administered two forms of anchoring vignettes questions characterized by different orders of anchoring vignettes, and the current study only retained anchoring vignettes responses from those who took forms with the same order as CHARLS. The Chinese and the US sample were vastly different in terms of educational attainment (see Table 1). In addition, the Chinese sample was younger and had more males.

The Chinese and US samples were administered largely the same vignette questions, differed mainly by the names of the hypothetical persons. CHARLS used common Chinese names in the questions. DVS Vignette 1 was already listed in the introduction section. The other two anchoring vignettes were shown below.

Vignette 2

“Sue is keen to learn new recipes but finds that she often makes mistakes and has to reread several times before she is able to do them properly.”

Vignette 3

“Eve cannot concentrate for more than 15 minutes and has difficulty paying attention to what is being said to her. Whenever she starts a task, she never manages to finish it and often forgets what she was doing. She is able to learn the names of people she meets.”

Results

Anchoring vignettes

Both the US and Chinese older adults agreed on the relative difficulty of the three hypothetical cases in general, as demonstrated by the increasing level of average rated difficulties of the three anchoring vignettes. However, the absolute levels of the ratings were different across the two countries, especially for vignette 3, the most severe case of cognitive impairment: the Chinese assigned much lower difficulty ratings to vignette 3 than the US older adults, demonstrating clear differences in reporting styles across the two populations.

Self-rated cognitive impairment and directly assessed memory scores

The middle panel of Table 2 shows the self-rated cognitive impairment both before and after adjusting for age, gender and education levels. The Chinese and US older adults presented similar levels of subjective cognitive impairment before adjusting for any differences in age, gender and education levels ($p=.07$). After adjusting for the

above three covariates, the Chinese older adults demonstrated lower levels of subjective cognitive impairment ($p < .001$).

The lower panel of Table 2 shows the raw and adjusted means of scores from the directly assessed immediate and delayed word recall tests. In contrast to the subjective ratings, the US older adults demonstrated better performance in immediate and delayed word recall tests than the Chinese older adults.

Adjusting for reporting heterogeneity using anchoring vignettes

The first column of Table 3 presented the results from a traditional ordered probit model of self-rated subjective cognitive impairment, and such model did not account for reporting heterogeneity. The last row of column 1 shows that the Chinese older adults showed lower levels of subjective cognitive impairment than the US adults.

King et al. (2004) proposed a parametric model to deal with reporting heterogeneity, where threshold were estimated incorporating information from the anchoring vignettes, and such model is called the hierarchical ordered probit (HOPIT) model. The last column of Table 3 presented results from the HOPIT model. The last row of the HOPIT model shows that the effect of cross country difference was now reversed: Chinese had higher levels of cognitive impairment than the US older adults.

Conclusion

Despite lower levels of directly assessed memory functions, the Chinese reported lower levels of cognitive impairment than the US adults. Such discrepancy is likely due to differences in reporting styles of the two populations. After adjusting for reporting heterogeneity using data from three anchoring vignettes, Chinese older adults showed higher levels of cognitive impairment than the US older adults.

References

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Table 1. Key demographic characteristics of the US and Chinese sample of older adults

Characteristics	US (n=4,419)	China (n=2,869)
Age (in years)	66.3 (SD=10.1)	62.2 (SD=8.5)
Male	40.2%	47.8%
Education		
Less than primary	2.1%	50.6%
Primary	4.5%	22.7%
Junior high	9.4%	15.2%
High School+	84.0%	11.5%

Table 2. Vignettes ratings, self rated cognitive impairment, directly assessed cognitive scores by the US and Chinese respondents aged 50+: raw and adjusted means

	US (raw)	US (adjusted)	China (raw)	China (adjusted)
Vignette 1	1.99	2.17	1.90	1.88
Vignette 2	2.87	2.92	2.50	2.51
Vignette 3	3.71	3.62	2.69	2.68
Self-rating	1.81	2.10	1.85	1.82
Word Imm	5.72	4.75	3.44	3.46
Word	4.75	3.79	2.56	2.49
Delayed				

Table 3. Estimating the Effects of Covariates on Subjective Cognitive Impairment using Ordered Probit and HOPIT

	Ordered Probit		HOPIT	
	value	t	value	t
Male (vs. female)	-0.135	-2.947	-0.1	-3.039
Age group				
60+	0.171	3.197	0.081	2.113
70+	0.315	4.994	0.114	2.508
80+	0.835	10.323	0.428	7.321
Education level				
primary	-0.482	-5.631	-0.283	-4.678
junior high	-0.627	-6.955	-0.351	-5.540
senior high+	-1.149	-13.211	-0.634	-10.392
China (vs. US)	-0.726	-9.765	0.180	3.387