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They Are Richer But Are They Happier? Subjective Well-Being of Chinese Citizens Across the Reform Era

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Abstract This study examined Chinese's subjective well-being (SWB) in the past two decades. By capitalizing on the single time-series data available on SWB in China during the reform era (spanning for nearly two decades) and adopting a newly-developed cross-classified random effects model that can disentangle the confounding effects of age, period and birth cohorts, this analysis detects significant age and period effect. First, Chinese exhibits a curvilinear and concave relation between age and life satisfaction. Secondly, economic prosperity in the past decades did not translate into greater satisfaction with life among Chinese people. Significant period effect reveals a V-shape pattern of life satisfaction: the declining trend has continued throughout the 1990s and the beginning of the millennium. By 2007 (the most recently available), the life satisfaction of Chinese people has rebounded to some extent, albeit still considerably lower than in 1990. Subsequently, in search of explanations for this overall trend of plummeted subjective well-being among Chinese citizens over time, whether and how the rising inequality asserts its influence on SWB in China's context are tested and discussed.

Keywords Subjective well-being · Age-period-cohort cross-classified random effect model · China

1 Introduction

China's post-1978 economic reform has led to fundamental changes in its life. How large-scale social changes have exerted its effect on individuals' well-being has attracted much scholarly attention. A large body of literature has focused on how a massive societal transformation affects income distribution and job mobility (see, e.g., Bian and Zhang

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2002; Bian 1994; see, e.g., Bian and Logan 1996; Nee 1989, 1991, 1996; Nee and Stark 1989; Nee and Su 1996; Shu and Bian 2003; Wu and Xie 2003; Zhou 2000). While these studies have shed useful insights on the quantity of life in reform-era China, little attention has been paid to the *quality* of life under the effect of this massive societal transformation: Are Chinese living a better life?

Scholars have convincingly argued for the utility of subjective well-being (SWB) as useful indicators to assess quality of life in the overall population and in population subgroups (e.g., Diener and Suh 1997; George 2006). If a person experiences his/her life as good and desirable, it is assumed to be so. Measurements of quality of life in terms of SWB are also useful for determining the extent to which societies meets the needs of their members and the degree to which citizens thrive (Veehoven 1993). Subjective well-being is usually defined as a state of stable, global judgment of life quality and the degree to which people evaluate the overall quality of their present lives in a favorable way (Diener 1984). Typically, SWB is measured by overall happiness (see, e.g., Campbell et al. 1976; Hagerty 2000; Shyns 1998) or life satisfaction (e.g., Andrews and Withey 1976; Rampichini and D'Andrea 1997; Shinn 1986)[1]

How do Chinese evaluate their life in reform era? The answer to this question bears both empirical and theoretical significance. First of all, a sociological tradition dating back to Emile Durkheim ([1897] 1951) has pointed out the potential influence of profound socioeconomic changes on individuals beyond their material life. A focus on Chinese's subjective wellbeing can extend the literature on China's transition beyond the economic realm. Moreover, with its rapid and sustained economic growth for nearly three decades, contemporary China provides an interesting case to gauge a long-standing inquiry of wealth-happiness relation. As the world rushes toward greater industrialization and development, it is imperative that we understand how wealth affects subjective welfare. However, even though shedding important and interesting insights, previous research in this regard has been concentrated in developed nations, which arguably have already completed the process of industrialization. While systematic investigations of the dynamics of SWB across the life course and over time in a developing country with strong economic growth are generally lacking (Diener et al. 1995), this study contributes to filling this gap by capitalizing on the single time-series data available on SWB in China during the reform era (spanning more than a decade) and exploring the temporal sources of variations in SWB.

The paper is structured as follows: Sect. 2 provides a review of literature on wealth-happiness association, to set the context for the present study; Sect. 3 describes the data and the analytical strategies this study uses; Sect. 4 displays and discusses the results from the analysis. Finally, the paper concludes with a discussion of the implications of the findings.

2 Literature Review

The relationship between income and SWB has been a focus interest for many scholars researching on SWB and previous research on such relationship has been equivocal. Based on absolute utility theory, higher income yields higher utility, because it can offer an individual more opportunities to fulfill what s/he desires, thus increases life satisfaction

[1] When referring to subjective well-being, life satisfaction and happiness are used interchangeably throughout this paper for readability, even though the author is aware of their conceptual differences (Diener 2006).

(Shyns 1998; Veenhoven and Ehrhardt 1995). The traditional income-based measure of development to some extent underlies this assumption of the absolute utility of income. However, such intuition has been challenged by what is referred to as "Easterlin paradox"—economic growth in rich countries over the last 50 or so years, does not appear to have led to commensurate improvements in their happiness (see: e.g., Diener and Suh 1997; Easterlin 1974, 1995, 2001; Oswald 1997).

This anomaly has been explained by the change of reference norms: norms and expectations also adapt upward with economic progress. Thus the expected gains of income on happiness are mediated by the rising aspirations that accompany the income gains. This explanation is in close association with social comparison theory in psychology. In contrast with the absolute utility theory which asserts that subjective appreciation of life depends on objective living conditions, social comparison theory argues that the evaluation of life is based on a mental calculus, in which perceptions of life-as-it-is are weighted against standards of how-life-should-be. Standards of comparison are presumed to be variable rather than fixed, and to follow perceptions of possibilities. In other words, we would judge life by what we think it can realistically be. Therefore, improvement of living conditions in a country would inevitably involve a rise of standards (Brickman and Campbell 1971; Easterlin 1974).

The proposition of relative income may be particularly useful in explaining the conundrum in a number of highly developed countries to which the earlier study of SWB is exclusive. Data from the United States have demonstrated that relative concerns primarily affect people who have an above-average income (Dynan and Ravin 2007). However, such concern may not enter the mind of those whose basic needs are yet to be met. Corroboratively, when researchers undertake comparative studies which include poorer countries, the cross-country data often shows much stronger correlations between subjective well-being measures and a nation's average income. People in wealthier countries are found, on average, to be more satisfied with their lives than people in poorer countries (e.g., Cantril 1965; Diener et al. 1993; Veenhoven 1991). Particularly noteworthy, Diener and Diener (1995) have provided evidence that improvements in material living standards yield greater happiness, especially at low levels of per capita income.

By far evidences suggest that increasing income levels—and economic growth—are a necessary but not sufficient condition for development. Social scientists have been gaining awareness and understanding of the gap between economists' assessments of societal progress based on traditional income-based measures and the assessments of the average citizen experiencing the process. People's subjective experiences of the world also depend on the norm of fairness and equity, which vary by time and society. One mediating link between wealth and SWB has not received its due attention until recently is whether and how distribution of wealth affects subjective welfare. Evidence generally supports that inequality does indeed matter to individual wellbeing, albeit with mixed findings. One line of argument is that inequality brings unhappiness simply because people have distaste for inequality, irrespective of their economic status. In line of this argument, Thurow (1971) argues that the taste for equality increases with income, an observation consistent with the fact that the share of government transfers over GDP is higher in richer countries.

Unlike the altruistic preference proposition, the self-interest argument predicts the effect of inequality on individual's wellbeing contingent on what inequality signals for people living in a given society. Alesina et al. (2004) find that inequality has generally negative effects on reported well-being in Europe and the US, but with differences across groups. Inequality has a modest negative effect on all respondents in Europe, and it is strongest for the poor. By contrast, in the United States the only group made less happy by inequality is left-leaning wealthy respondents.

The authors posit that differences in views about the prospects of upward mobility between the two continents explain these results. Such interpretation is supported by studies that link people's perceptions about mobility—such as perceived prospects of upward mobility—with voting behavior and views about redistribution. Most of these studies suggest that societies with widely held faith in prospects for upward mobility are more tolerant of income inequality than those where social mobility is more limited. Benabou and Ok (1998) developed a model that they applied to data from the panel study on income dynamics and found that even though the majority of Americans are well below the mean income level, they do not vote for redistribution because they believe that they will be above the mean in the future (even though this is an unrealistic expectation for the median voter) (see also, Piketty 1995).

Other authors have found divergent effects of inequality on well being, depending on the data and the countries that are used. Clark (2003) uses data from the British Household Panel Survey (from 1991 to 2002), and finds that regional inequality and life satisfaction are positively correlated. He posits that for these respondents, inequality is a sign of opportunity. Clark notes that his results are in keeping with an earlier study by Tomes (1986), which finds that inequality across districts is positively correlated with well being for men in Canada. On the other hand, Hagerty (2000) uses aggregate data from eight countries and shows that average happiness levels are lower in those with wider distributions. In the case of Japan, Oshio and Kobayashi (2010) combined two nationwide survey and found that individuals who live in areas of high inequality tend to report themselves as both unhappy and unhealthy, even after controlling for various individual and regional characteristics and taking into account the correlation between the two subjective outcomes. From a longitudinal perspective, Stevenson and Wolfers' (2008) analyses of happiness distribution in the US from 1972 to 2006 reveal intriguing patterns of happiness dispersion mirroring change in income inequality: the black-white and female-male happiness gaps have eroded or disappeared concurrent with a decline in black-white and female-male wage inequality over time; whereas differences in happiness by education have widened substantially paralleling increasing income inequality during the period.

Fewer studies of inequality and happiness have been conducted in developing countries. Senik (2004), using data from the Russian Longitudinal Monitoring Survey, finds no relationship between happiness and regional level Gini coefficients in Russia. Eggers et al. (2006), using the same survey for different years, corroborate Senik's findings. They also find that respondents (both employed and unemployed) are happier in regions with higher unemployment rates. They posit that inequality in Russia tends to accompany economic change and market-oriented reforms, while unemployment rates are higher in regions where reform has been less extensive. Inequality may be a signal of progress and mobility for those who are engaged in and benefiting from reform, yet a threat or the source of envy for those who are not.

The series of investigations highlight the extent to which distributional income can have different effects on individual wellbeing, depending on the contexts under investigation. China can be a context particularly interesting and illuminating to examine this topic. The most salient feature of China's economic development over the past 30 years has been its rapid and sustained economic growth. The economy has grown at an average annual rate of more than 8 %, fundamentally improving the living conditions of many of the 1.3 billion Chinese (Klein and O'zmucur 2002). While increase in income can certainly bring greater utility, it has also been noted that China's economic growth has not been even (see, e.g., Griffin and Zhao 1992; Khan et al. 1992). As Tang and Parish (2000) pointed out, the transition to a market economy implies fundamental changes in the government's social

contract with society. Whereas the introduction of market mechanism and competition may have accentuated senses of uncertainty and instability (Yu 2008), it also offers greater potential for wealth accumulation and occupational achievement in return for individualistic pursuits, thus likely to enhance perception of mobility. As the state retreats from its patriarchal role in promising job security, equal distribution of resources, feelings of insecurity can arise as one's future becomes less predictable (Mirowsky and Ross 2003). But at the same time, with the receding role of work units, the state has loosened up its tight grip on ordinary individual's lives. There has been increasing evidence indicating restructuring of private and public domains as well as the diversification of contemporary social life and culture in China (Wang 1995; Wei and Pan 1999). For example, access to news and information is increasing through increased international travel and through the internet (despite attempts at censorship—the so-called ''great firewall of China''). People can discuss political issues in small groups of trusted friends. In short, as a result of the reduced control of the state, the Chinese citizens should experience greater sense of freedom. And it has been shown that the enhanced sense of freedom is significantly related to SWB (Inglehart et al. 2008). In light of multiple mechanisms possibly at work, how Chinese's subjective life fares in reform era largely lends itself to empirical investigations.

Given China's size and importance to the world economy, surprisingly, the literature on Chinese's SWB is rather thin. Insights provided from the few available studies are usually limited to certain regions (Ji et al. 2002) report on data from Shanghai and Tianjin in 1993; see (Liao et al. 2005) for a comparison between Hongkong and Taiwan in 2000) or to a static point of time (see (Appleton and Song 2008; Shu and Zhu 2009) for a more representative sample in 2002). The present analysis is expected to add new insights to the findings from the preceding studies. By utilizing a time series data on life satisfaction in China from 1990 to 2007, the analysis will depict a trajectory of how Chinese's SWB has been changing in reform era. Thus it provides a more direct test of wealth-happiness link, because it has been argued that culture may play a more important role than economic development in explaining why people perceive quality of life differently from nation to nation (Diener et al. 2003; Falkenberg 1998; Oishi et al. 1999; Shyns 1998). By focusing on one country over the period of strong economic growth, we control the cross-cultural differences between poor and rich countries.

Furthermore, studies of time trends in SWB (e.g., simply calculating and comparing mean score on SWB in discrete time points) can confound the inference of period effect without the consideration of age group differentials. And the differential time trends by age groups can reflect cohort differences. For example, Easterlin, Morgan and Switek (2012) conduct comprehensive analyses of trends in Chinese life satisfaction from 1990 to 2010 using this approach without disentangling the different dimensions of time. According to Ryder (1965), cohort effect represents the effects of formative experiences, which can be particularly impressionable. Very few countries in recent history have experienced the number and magnitude of societal changes that have occurred in China's modern history—from revolution to communist consolidation, and then from the subsequent Cultural Revolution to the economic reform—each turn in social and political vicissitude was marked by completely distinctive historical era from the past. It is plausible that differences in the socialization and the formative experiences of the cohorts may have lasting and disparate effects on their psychological wellbeing. Therefore, to assess true period effect due to the economic reform, we need to disentangle it from potentially confounding age and cohort effects. To this end, the present study utilizes recently developed methodologies of hierarchical age-period-cohort models (Yang and Land 2006) to gauge the net period effect and further exercise a formal test of how the change of inequality over the period asserts its influence on SWB in the context of Chinese society.

3 Data and Methods

3.1 Samples and Measures

This study uses data from four national probability samples of Chinese individuals 18 years and older. The surveys were conducted in 1990, 1995, 2001 and 2007 as part of the World Values Survey administered by the World Values Survey (WVS) Association located in Stockholm, Sweden. The surveys conducted in 1990 and 2001 each include 1,000 personal interviews; the survey conducted in 1995 consists of a sample size of 1,500 interviews; and the 2007 survey data expands the sample size to 2015 subjects. All these surveys were designed to be representative of the Chinese adult population at the time of surveys, with multi-stage probability sampling methods.

In all years, the WVS item on SWB is "All things considered, how satisfied are you with your life as a whole these days?" The responses range from 1 to 10, with 1 indicating "dissatisfied", 10-"satisfied". While both general happiness and personal life satisfaction are commonly used quality-of-life indicators in empirical research, life satisfaction is the preferred formulation here, as it avoids the ambiguity of happiness as well as the transitory character of affective states (e.g., Veenhoven 1997). There is some evidence that life satisfaction tends to reflect relatively stable, long-term judgments of well-being, whereas happiness reflect more short-term reports SWB and show situational variability (George 1981). I am more interested in Chinese people's cognitive evaluation of their life situation than their emotions, which happiness question connotes (Diener et al. 1995; Kozma et al. 1991). It is generally agreed that this simple item of life satisfaction performs as well or better than more complex formulations (see, e.g. Veehoven 1993). The measure exhibits validity (Veenhoven 1996), moderate stability, and appropriate sensitivity to changing life circumstances (Heady and Wearing 1991).

Key individual-level variables include respondent's age (grand-mean centered), sex (male = 1; female = 0), marital status (1 = married; 0 = otherwise), education level (ranges from 1 to 3, with 1 indicating the lowest level = primary education or less; 2 = secondary schooling; 3 representing the highest level = colleges or higher) and the income information based on ten brackets of household income in ascending order. The analysis also adjusts for other characteristics that are shown to be correlated with SWB. Employment status categories include stable (full-time and self-employed), unstable (unemployed and other) and not part of the labor force (students, homemakers and the retired). Health status is indicated by self-rated health (from 1 to 5, with higher score indicating more positive rating). The sense of freedom and control in life is scaled from 1 to 10 (with 1 = none at all; 10 = a great deal). And an index of market liberalism is created by taking the average of how respondents view inequality ("Incomes should be made more equal vs. We need larger income differences as incentives"), private business ("Government ownership of business should be increased vs. Private ownership of business should be increased"), government redistribution ("The government should take more responsibility to ensure that everyone is provided for vs. People should take more responsibility to provide for themselves") and competition ("Competition is harmful. It brings the worst in people vs. Competition is good. It stimulates people to work hard and develop new ideas"). The index is coded in such a way that higher score means greater preference for competition, income differences as incentives, private ownership and less government redistribution. The summary statistics of all variables are presented in Table 2 in the "Appendix".

While there appeared to be a convention in forming ten-year birth cohort groups (Glenn and Norval 1983), many scholars seem to agree on the general principle that in assessing social and cultural change, bringing about the observed change of the differences in the socialization and the formative experiences of the cohorts bears great theoretical import (Mannheim 1952; Thompson and Thompson 1990). Based on the way in which individual lives intersect with Chinese history, cohorts for this analysis are defined as the following[2]cohort groups in China's context.: Children of Old China (born 1908–1938); Children of New China (born 1939–1946); The "Lost" Generation (born 1947–1955); Children of Early Cultural Revolution (CR) (born 1956–1960); Children of Late CR (born 1961–1966); Children of Economic Reform (born 1967–1976); Children of Opening-Up (born 1977 and later). A frequency table of cohorts cross-classified by periods is summarized in Table 3 of "Appendix".

To further explore what accounts for the period effect, I include the Gini coefficients of the years of survey into the analysis after I detect the significant net period effect. The Gini coefficient is one of the most widely used inequality measures and its estimate on China has skyrocketed from 0.35 to 0.47, a level which is comparable to some of the most unequal countries in Asia and Latin America. It is important to formally assess what this income difference of increasing magnitude means for Chinese people, which has not been addressed before. The measures of Gini coefficients are from World Bank estimates (Chen et al. 2010; Ravallion and Chen 2007) and are treated as a higher-level contextual variable in the model.

3.2 Analytic Methods

Yang and Land (2006) noted that regression analyses on the micro sample data may violate the independence-of-errors assumption on which conventional ordinary least squares or logit regression are based on. It is possible that sample respondents who were surveyed at the same historic point and who belonged to the same cohort group may have similar responses because they share random error components unique to their period and cohort. Adequate models must take into account this level-2 heterogeneity for valid statistical inference.[3] For remedy, they applied cross-classified random-effects two-level models (CCREM) to repeated survey data to disentangle and detect true age, period and cohort effects.

Adopting this methodology, the analytical strategy of the present study contains the individual-level and contexts-level models. The individual level model can be summarized as follows:

$$Y_{ijt} = \beta_{0jt} + \sum \beta_{kjt} x_{ijt} + r_{ijt}$$

where Y_{ijt} is the life satisfaction level for individual i, of birth cohort j, in period t. β_{0jt} is the intercept parameter for the regression model, $\sum \beta_{kjt}$ denotes the effects of k individual attributes. $r_{ijt}$is the normally-distributed random error term. To address the potential pitfall of violation of independence-of-error assumption, the intercept of equation (1) is modeled as context dependent and formulated as:

[2] Thanks to the anonymous reviewer for the insightful suggestion of how to derive meaningful.

[3] Although ignoring the complicated error structure may not seriously affect the estimates of regression coefficients, it may lead to underestimated standard errors, inflated t-ratios, and Type I errors that are much larger than the nominal alpha level (Hox and IKreft 1994).

$$\beta_{0jt} = \gamma_{00} + u_{0j} + v_{0t}$$

γ_{00} is the model intercept or grand-mean SWB score of all individuals; u_{0j} is the residual random effect of cohort j (i.e., the contribution of cohort j averaged over all periods) on β_{0jt}, assumed normally distributed with mean 0 and variance τ_u; and v_{0t} is the residual random effect of period t (i.e., the contribution of period t averaged over all cohorts, assumed normally distributed with mean 0 and variance τ_v).

It should be noted that although the number of cohorts and time periods in the present study is small to moderate, a random effect specification is chosen because methodological comparisons of the fixed and random period and cohort effects formulations show that the random-effects specification is more statistically efficient regardless of whether the numbers of birth cohorts and time periods are moderate (19 cohorts and 15 time periods) or small (5 cohorts and 5 time periods), especially in cases where the research design is "unbalanced", which is usually noted for repeated cross-section survey data (Yang and Land 2008). And the following analyses are made using the maximum-likelihood-empirical Bayes estimation methods (Raudenbush and Bryk 2002).

4 Results and Findings

Table 1 presents my main estimation results. As the response of life satisfaction is measured on a ten-point scale, it is strictly speaking an ordinal measure, which requires an ordered response model (Wooldridge 2002). Nevertheless, since the scale is rather large and the qualitative results turned out to be equivalent, I will focus on least squares for the ease of presentation. First, the overall trends of life satisfaction in Chinese society are illustrated in respect to different time dimensions of age, period and cohort. I then explore the social differentials in SWB across life course and over time. After the true period effect is established, I investigate what might account for the uncovered period effect by focusing on the influence of period-specific inequality measure.

The estimates of random effects in terms of residual variance components at level-2 indicate significant period effect and cohort effect controlling for the age effect, as reported in the lower panel of Table 1. Figure 1 presents the overall trends of life satisfaction estimated from this model. Figure 1a displays the estimated period effects, calculated as $\widehat{\gamma}_{00} + v_{0t}$, where$\widehat{\gamma}_{00}$ is the intercept or estimated overall mean and v_{0t} is the period-specific random-effects coefficients estimated from model 1. The period effects show a continuous decline in reported life satisfaction in Chinese society from 1990 to 2001, followed by a moderate rebound in the year of 2007.

Figure 1b shows the estimated cohort effects in terms of life satisfaction score at the mean age and averaged over all periods. Surprisingly, cohort membership does not render statistically significant impact in presence of the period variance component. It seems that the different socialization and experiences in formative years of different cohorts are not bourn out in their subjective wellbeing in adulthood. However, additional analyses show that cohort effects are significant when treated as a stand-alone random effect ($p < 0.001$), but lost statistical significance once the period variance component is added to the model (analyses not shown here, but available upon request). This may indicate a strong adaptive capability of Chinese. Early life conditions are subsumed to contemporary social transformations.

Figure 1c shows the significant curvilinear and concave age effect. As the net age effects suggest, the average life satisfaction level bottoms out around the middle age of 41 and increases at a slow rate as one moves through the life course.

Table 1 Cross-classified random effects model of WVS_China life satisfaction data (N = 5,515): 1990–2007

	Model 1	Model 2	Model 3	Model 4
Individual effects				
Intercept	6.9813 (0.16)***	3.9205 (34)***	3.5188 (0.22)***	1.6340 (0.28)***
Age	−0.0221 (0.01)**	−0.0308 (0.01)***	−0.03020 (0.01)***	−0.02490 (0.01)***
Age 2	0.0006 (0.00)	0.001 (0.00)***	0.0010 (0.00)***	0.0008 (0.00)***
Male		−0.1956 (0.07)***	−0.19400 (0.07)***	−0.2512 (0.06)***
Married		0.513 (0.10)***	0.4929 (0.10)***	0.4080 (0.09)***
Education (ref. = elementary or less)				
Education 1 (secondary school)		0.2096 (0.07)***	0.2104 (0.07)***	0.11010 (0.07)
Education 2 (college and higher)		0.2652 (0.12)	0.2646 (0.12)	0.1116 (.ll)
Employment status (ref = stable)				
Unstable out of labor force		−0.3035 (0.09)*** −0.1605 (0.10)	−0.2990 (0.08)*** −0.1632 (0.10)	−0.1575 (0.09)† −0.12230 (0.10)
Health		0.4357 (0.02)	0.4377 (0.02)	0.3305 (0.02)***
Income decile		0.2709 (0.02)	0.2699 (0.02)	0.2284 (0.02)
Market liberalism				0.0554 (0.02)***
Sense of freedom				0.3221 (0.01)***
Contextual effects				
Gini coefficients			−1.62300 (0.52)	−0.1252 (0.06)
Gini 2			0.0188 (0.01)***	0.0144 (0.01)†
Period effect	0.0895 (0.08)	0.2619 (0.19)***	0.0319 (0.07)***	0.0642 (.10)
Cohort effect	0.0029 (0.01)			
Cross-level interaction effects				
Income level × Gini coefficients				0.0122 (0.00)***
Sense of freedom × Gini coefficients				−0.0046 (0.00)
Liberalism × Gini coefficients				0.0141 (0.00)***
Goodness–of–fit (BIC)	24,885	21,653	21,662	19,891

† $p < 0.1$; ** $p < 0.05$; *** $p < 0.01$ (two-tailed tests)

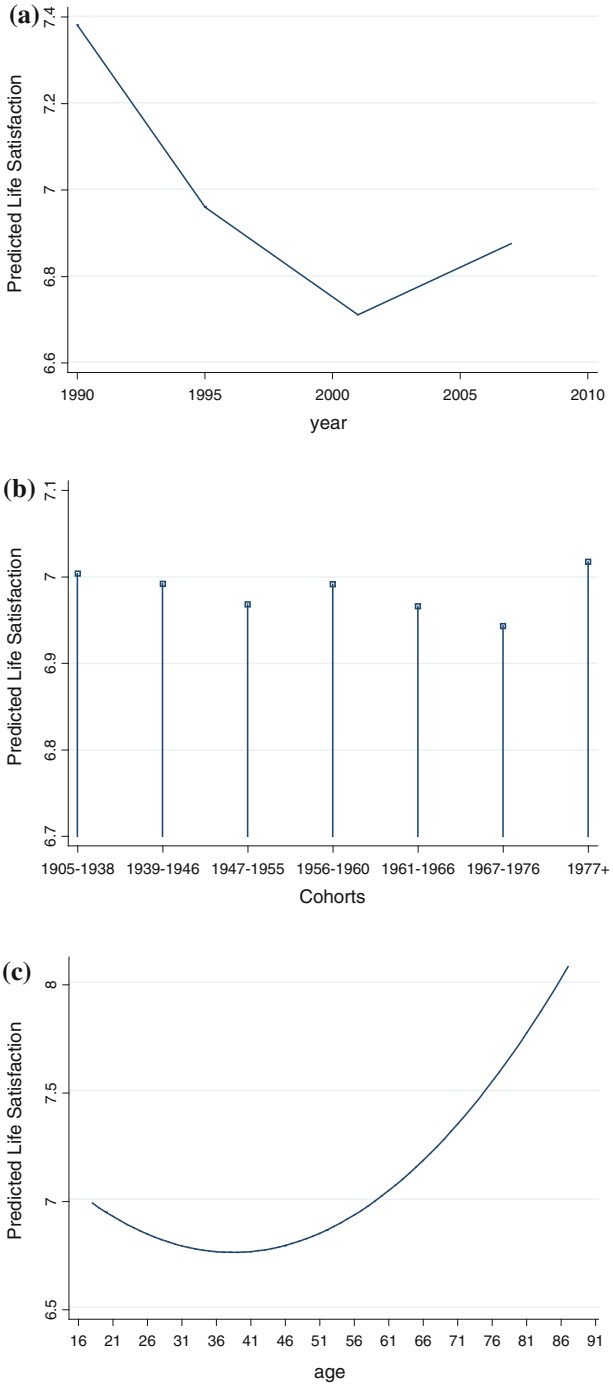

Fig. 1 Overall period, cohort and age effects on Chinese's life satisfaction: 1990–2007. **a** Period effect. **b** Cohort effect. **c** Age effect

As the hypothesized clustering effect of observation due to shared cohorts turns out to be insignificant, the random effect of cohort is dropped from the subsequent model fitting. Model 2 examines the covariates at the individual-level that affects one's SWB in China's context. Results show that women, married people, those in good health express greater life satisfaction relative to men, unmarried and people who are less positive about their health conditions. The detrimental effect of unstable work status upon SWB also stands robust in reforming China, corroborating with findings in other countries. In terms of other employment status, those who are not part of the labor force such as the retired, homemakers and students do not significantly differ from the group with stable employment in terms of their SWB. The higher socioeconomic status, measured by education and income, makes people happier. Similar with American people, marital status and health status have by far the strongest influences on one's life satisfaction (Yang 2008). For Chinese people compared to those who are not married, the status of being married gains 0.49 in life satisfaction on a 10-point scale. Particularly noteworthy from Model 2 is that net of age and other social status indicators, there are significant variations in Chinese's SWB that can be attributed to period-specific factors.

Now that the true period effect has been established, subsequent analysis is undertaken to explore what might explain the change of Chinese's SWB for the past two decades. One of the most plausible hypothesis lies in that increasing social inequality has instigated an acute sense of relative deprivation among Chinese, which has a depressing effect on their subjective wellbeing. When considering income as the object of relative deprivation, Yitzhaki (1979) suggested that an appropriate index of aggregate deprivation is the absolute Gini index. Thus a formal test of how inequality impacts Chinese's SWB is conducted by adding period-specific Gini coefficients in Model 3. We see that incorporation of the period-specific Gini coefficients helps to explain some of variance of SWB over time: the variance component attributed to periods has reduced from 0.260 to 0.032. The results from the Model 3 prove that there is indeed a negative effect of inequality on reported life satisfaction among the Chinese public. But this significant negative effect tends to gradually level off over time, as suggested by a positive quadratic term that is also statistically significant. Figure 2 displays this curvature pattern between the inequality measure and Chinese's SWB. It seems that the dramatic rise of inequality in a short time span can have a really detrimental effect on people's subjective wellbeing. However, such harmful effect tends to diminish over time, possibly pointing to adaptability of human being. Perhaps as Chinese grow more accustomed to the prevalent social inequality, they become less affected by it cognitively.

Since further investigation is needed for delineating pathways or mediation process from income inequality in society with respect to subjective outcomes at an individual level (Oshio and Kobayashi 2010), in the final model a series of interaction effects between Gini coefficients and individual attributes are analyzed in an attempt to explore this meditational process.

The final model (Model 4) yields the smallest model deviance adjusted by degrees of freedom as measured by the BIC statistic and, therefore, significantly improves the model fit over all previous models in Table 1. Several interesting findings are revealed here. Chinese, who embrace market liberal values, i.e., endorsing competition, private business and income disparity as incentives as well as averting government redistribution, tend to express greater life satisfaction. One might argue that such effect may be spurious manifestation of economic conditions: those who have benefited from economic reform surely will be more welcoming to market liberalistic principles. Notwithstanding, it should be noted that the value of market liberalism significantly contributes to SWB *net* of the effects

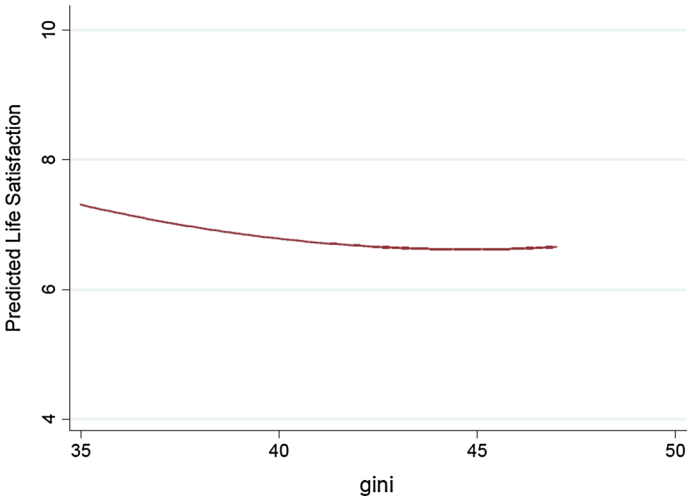

Fig. 2 The fitted regression line of line satisfaction on Gini coefficient from model 3

of economic status such as education and income. However, the significance of education level to one's SWB does appear to be mediated through the influence of market liberalistic values. The more educated are more apt to align themselves with market liberalism (F statistics of ANOVA analysis equals 136.06, $p < 0.001$). Stepwise analysis revealed that once the role of market liberalistic value is taken into account, the disparity in SWB between different education groups turns insignificant.

To what extent then the relation between market liberalism and SWB is shaped by inequality? Significant interactions terms suggest that as societies get more unequal, those who oppose government redistribution are likely to gain in life satisfaction, which may just indicate the effect of coming to terms with reality. In a similar vein, as societies becomes more unequal, household income shows an increasing effect on SWB, whereas the sense of freedom shows a diminishing impact on SWB, though this effect does not reach statistical significance. Inglehart et al. (2008) have shown that democratization and growing social tolerance are among the most important forces that lead to a rising feeling of freedom. It appears that inequality in society impinges upon individual's subjective world mainly through its impact on prioritizing what is considered a good life. All life domains, including the material life domain, vary in *salience*. That is, some life domains may be more important than others. Data from Chinese society suggests that as a society becomes more unequal, the material life domain is increasingly considered to be highly salient relative to other life domains, such as political freedom or societal diversity. But strongly internalizing value of materialistic pursuits has been shown to be inimical to high SWB (see, e.g., Ahuvia and Wong 2002; Richins and Dawson 1992; Sirgy 1997), as it leads to an ever-rising bar of perceived needs. Psychologists have also hypothesized the relationship to be so because striving for material goods does not fulfill intrinsic human desires (Ahuvia and Wong 1995; Belk 1985; Kasser and Ryan 1993, 1996).

5 Discussion and Conclusions

There have been tremendous debates about the nature of the link between wealth and happiness, with little attention paid to China, a developing country with rapid and sustained economic growth for the past three decades, which could potentially offer interesting insights on the topic. The few available studies on Chinese's SWB either focus on its cross-sectional individual-level determinants or offer descriptive sketches of trends of SWB at discrete time points without controlling other time-related dimensions including age and birth cohorts, whose effects may interfere with the inference of true period effect. Using time-series data on life satisfaction that span nearly 20 year, and improved statistical models that disentangle the confounding effects of age, period and birth cohorts, this study is among the first attempts to provide comprehensive temporal model for understanding the distinct effects of internal characteristic and external circumstances on perceptions of life quality in Chinese society.

The results from hierarchical age-period-cohort analysis provide new evidence of life-course and temporal change in subjective quality of life in China that can be attributed to the processes of aging and social changes.

Chinese exhibits a curvilinear and concave relation between age and life satisfaction. The middle-aged express the least satisfaction with their life compared to the younger and older adults, maybe reflecting the psychological cost of entering "sandwich generation", when the stress of managing professional and personal life is at a peak (Mortimer and Shanahan 2006). Nevertheless, as one moves further along the life course, he/she expresses greater content with life. It appears that older adults report greater satisfaction with life, regardless of culture. This finding remains robust across the distinct cultures of Europe, America and China (see, e.g., Pinquart and Sorensen 2000; Yang 2008). In explicating the behavior changes during the process of aging, research stemming from the socioemotional selectivity theory has illustrated that awareness of limited time in old age is associated with heightened emphasis on feelings and emotion states, which particularly provides the sense of perspective that softens the experience of negative emotions and enhance the appreciation of positive aspects of life (Carstensen, Isaacowitz, and Charles 1999; Cross and Markus 1991). It appears that the process of aging is generally accompanied by a growing adaptation to the living environment (Whitbourne 1985) and shrinking discrepancies between aspiration and achievement (Cheng 2004; Ryff 1991), which is conducive to strengthening one's SWB.

The present study does find that levels of life satisfaction among Chinese have changed over time periods, net of other factors. The large-scale societal transformation in China precipitated a sharp drop in life satisfaction. The declining trend has continued throughout the 1990s and the beginning of the millennium. By 2007 (the most recently available), the life satisfaction of Chinese people has rebounded to some extent. This pattern seems to corroborate with U-shape pattern of life satisfaction uncovered in other transition countries (see: Easterlin 2009; Sanfey and Teksoz 2007). However, it should be noted that even in 2007, Chinese's life satisfaction was still considerably less than in 1990.

Much of this overall trend of declining SWB among Chinese citizens over time can be explained by depressing effect of relative deprivation instigated by rising inequality. As the society becomes more unequal, Chinese are propelled to place greater importance on materialistic goals, which in turn can breed ever-growing desire for higher standard of living. While the legitimacy of Chinese government has been largely based upon its ability to deliver economic prosperity (Wang 2005), it seems likely that Chinese government is facing the dilemma to gratify rising desire of its citizens. Meanwhile, Chinese themselves

have mentally suffered from this "materialization of happiness", because wanting and liking arise from two different neural systems (Berridge 1996) and relative high expectations of material success signal a fundamental alienation from the important psychological needs (reflected in intrinsic values) that truly provide well-being (Kasser and Ahuvia 2002; Kasser and Ryan 2001; Richins and Dawson 1992).

An alternative explanation of overall decreasing life satisfaction over time among Chinese could be rising sense of insecurity and uncertainty introduced by market system. Due to the insufficient information the data provide in this regard, unfortunately I am not able to directly test such hypothesis. But several evidences caution against such interpretation. First of all, if Chinese's lower SWB is mainly due to accentuated feeling of insecurity associated with market competition, we should expect them to show aversion toward such system. But around sixty percent of the sample in the present study embraces market liberalistic principles; and results of analysis suggest that preference of market liberalism is positively related to SWB, independent of one's socioeconomic status. Moreover, Appleton and Song's (2008) study included a measure of Chinese's satisfaction with job security, tested its effect on life satisfaction among a representative sample of Chinese in 2002 and found insignificant relationship.

While data on individual life satisfaction can provide one lens for studying social discontent and potential political instability, it is hard to predict what it signifies in China. Growing social inequality has aggravated social discontent; but this study also shows that such detrimental impact tends to diminish over time, perhaps because many Chinese gradually learn to live with reality. Additionally, the shifting priority of a good life to predominantly economic concerns rather than nonmaterial ones, incurred by intensified social inequality in Chinese society, does not bode well for prospects for political changes. Corroboratively, political scientists have searched in vein evidence of social forces among Chinese that express oppositional voice in fight for political space (Dickson 1997, 2003).

In conclusion, this study adds another piece of evidence that highlights the gaps between measures of welfare as reported in surveys of well-being and as gauged in standard terms, such as earned income or expenditures. Lack of increase in life satisfaction over a period of extraordinary economic boom in Chinese society again calls into question the relevance of growth as an objective of national policy, and as an aggregate measure of welfare (see, e.g., Easterlin 2003; Frank 1997; Luttmer 2004). It should be brought to wider awareness that models based on rationally calculated, income-based utility such as GDP may not capture what determines individual's wellbeing. In contrast, the SWB measure, which reflects not only material well-being, but the everyday concerns and worries of women and men about work, health, and family, is more indicative of the far-reaching changes that were taking place.

Peterson et al. (2005) suggested that three components contribute to life satisfaction: pleasure, engagement, and *meaning*. Policy makers in China are urged to keep abreast with larger social trends concerning the value of the individual and to recognize that well-being necessarily includes positive elements that transcend economic prosperity.

Appendix

See Tables 2, 3.

Table 2 Summary statistics for all variables in the analysis: WVS_China 1990–2007 (N = 5,515)

Dependent variable	Description and coding	Mean (SD)				Range			
		1990	1995	2001	2007	1990	1995	2001	2007
Life satisfaction	Level of life satisfaction:								
	l = dissatisfied; 10 = satisfied	7.29 (2.1)	6.83 (2.4)	6.53 (2.5)	6.76 (2.4)	1–10	1–10	1–10	1–10
Level–1 variables									
Age	Respondent's age at survey year	39.28 (14)	38.73 (13.9)	40.28 (11.5)	44.76 (13.3)	18–85	18–87	18–65	18–70
Male	Respondent's sex:								
Marital status	1 = male; 0 = female Respondent's marital status:	0.6 (0.5)	0.53 (0.5)	0.49 (0.5)	0.46 (0.5)	0–1	0–1	0–1	0–1
	l = married 0 = otherwise	0.78 (0.42)	0.81 (0.4)	0.87 (0.3)	0.85 (0.4)	0–1	0–1	0–1	0–1
Education[a]	Respondent's education level:								
	Elementary or Jess	0.4 (0.5)	0.4 (0.5)	0.42 (0.5)	0.52 (0.5)	0–1	0–1	0–1	0–1
	Secondary	0.42 (0.5)	0.5 (0.5)	0.54 (0.5)	0.41 (0.5)	0–1	0–1	0–1	0–1
	Postsecondary	0.18 (0.4)	0.08 (0.3)	0.04 (0.2)	0.06 (0.2)	0–1	0–1	0–1	0–1
Income	Respondent's relative income								
	1 = lowest step; IO = highest step	3.21 (1.7)	4.84 (1.9)	5.87 (2.1)	3.96 (1.9)	1–10	1–10	1–10	1–10
Health status	Respondent's self–rated health status								
	1 = very poor; 5 = very good	3.14 (1.4)	3.34 (1.4)	3.08 (1.4)	3.09 (1.4)	1–5	1–5	1–5	1–5
Employment status	Respondent's employment status								
	Stable	0.83 (0.4)	0.65 (0.5)	0.73 (0.4)	0.64 (0.5)	0–1	0–1	0–1	0–1
	Unstable	0.05 (0.2)	0.22 (0.4)	0.15 (0.4)	0.21 (0.4)	0–1	0–1	0–1	0–1
	Not part of the labor free	0.12 (0.3)	0.13 (0.3)	0.12 (0.3)	0.15 (0.4)	0–1	0–1	0–1	0–1
Market liberalism	Respondent's value orientation on								
	Market liberalism:	6.48 (1.5)	5.33 (1.9)	5.76 (1.8)	4.99 (1.9)	0.5–10	0.25–10	0.25–10	0.25–10

Table 2 continued

Dependent variable	Description and coding	Mean (SD)				Range			
		1990	1995	2001	2007	1990	1995	2001	2007
	Average score derived from tendencies of pro- income difference, private ownership and competition and against-government redistribution.								
Freedom	Respondent's perception of								
	Freedom	7.05 (2.2)	6.8 (2.6)	7.15 (2.5)	7.23 (2.3)	1–10	1–10	1–10	1–10
	1 = none at all; 10 = a great deal								
Level–2 variables			N				Range		
Period	Survey year		4				1990–2007		
Cohorts	Theoretical Cohorts based on shared early life experience		7				1905–1989		
			Mean (SD)				Range		
Gini coefficients			42.83 (4.4)				35–47		

The education variable has considerable missing cases for the year of 1990-33.9 %. Through the inspection of its frequency distribution, missing cases mostly indicate education as "not applicable" response category; and based on side information on the education level in China in general, the author finds the justification of imputing the missing cases and recoding them into; "the lowest level", because "not applicable" usually indicates that the respondents received minimum education or did not have any formal education at all

Table 3 Frequency of respondents cross-classified by period and cohort: China 1990–2007

Cohorts	Survey year				
	1990	1995	2001	2007	Total
1905–1938 (Children of Old China)	206	189	28	56	479
1939–1946 (Children of New China)	204	144	93	218	659
1947–1955 (The "Lost" Generation)	161	310	212	414	1,097
1956–1960 (Children of Early CR)	127	191	137	198	653
1961–1966 (Children of Late CR)	162	268	187	337	954
1967–1976 (Children of Economic Reform)	140	366	259	456	1,221
1977–1989 (Children of Opening-Up)	0	32	84	336	452
Total	1,000	1,500	1,000	2,015	5,515

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