Can Income Inequality be Associated with Positive Outcomes?

Hope Mediates the Positive Inequality-Happiness Link in Rural China

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Author Biography

Felix Cheung is a PhD candidate in Social and Personality Psychology at Michigan State University. His work focuses on the measurement of life satisfaction and individual and societal predictors of subjective well-being.

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Abstract

Prior studies on the inequality-happiness link have yielded mixed results, and tend to focus on mechanisms that explain the negative effects of inequality. The current study investigated the inequality-happiness link in China and examined hope as a mechanism that explains positive effects of income inequality. Using data from a large sample of 30,255 Chinese respondents, greater inequality was associated with higher life satisfaction in rural China but not significantly associated with life satisfaction in urban China. The positive inequality-happiness link in rural areas was mediated by hope. By providing evidence for a mechanism through which income inequality can lead to greater well-being, the current study sheds light on the heterogeneity of prior findings on the inequality-happiness link. These results supported a dual-process model of income inequality in which inequality leads to higher or lower subjective well-being through hope and social comparison depending on stages of economic development.

Keywords: life satisfaction, income inequality, China, hope, well-being

Can Income Inequality be Associated with Positive Outcomes?

Hope Mediates the Positive Inequality-Happiness Link in Rural China

Life satisfaction is the overall assessment of whether one is happy and content with one's life. It is an integral component of subjective well-being. The Organisation for Economic Co-operation and Development has called for the use of well-being measures to help guide policy. Recently, over 40 countries have adopted measures of population-level subjective well-being (Diener, Oishi, & Lucas, 2015). A rising policy-relevant issue is income inequality, and one of the goals of inequality-reducing policies is to increase subjective well-being. However, previous research on income inequality and life satisfaction has largely focused on European and American countries (e.g., Alesina, DiTella, & MacCulloch, 2004; Clark, 2003; Tomes, 1986) and has produced mixed results (Alesina, Di Tella, & MacCulloch, 2004; Berg and Veenhoven 2010; Graham & Felton 2006; O'Connell 2004; Oishi et al. 2011; Rozer & Kraaykamp 2012; Schneider, 2012; Verme, 2011; Zagorski, Evans, Kelley, & Piotrowska, 2014). A recent study by Xie and Zhou (2014) using multiple data sources has documented a sharp increase in income inequality in China. With this surge, there is a pressing need to understand the implications of rising income inequality in China. The aim of the current paper was to examine the inequality-happiness link in China.

Income Inequality and Well-being

Prior cross-national research has found negative (e.g., Graham & Felton, 2005; Verme, 2011), neutral (e.g., Zagorski, Evans, Kelley, & Piotrowska, 2014), and positive (e.g., Rözer & Kraaykamp, 2013) associations between income inequality and life satisfaction. However, respondents may be more aware of income inequality at the proximal neighborhood level than the distal national level. Moreover, there is a lack of empirical evidence on the measurement

invariance of life satisfaction measures across countries, especially for single-item measures, which are the most common measures in cross-national research. Therefore, it remains plausible that respondents from different countries used life satisfaction measures differently. To circumvent these concerns, other researchers have adopted a cross-regional approach looking at the inequality-happiness link within a particular country. Studies using a cross-regional approach have predominantly focused on developed Western countries and also resulted in mixed findings (e.g., Canada, Tomes, 1986; United States, Hagerty, 2000).

There is conflicting evidence regarding the main effect of income inequality on life satisfaction, leading to the need to understand the underlying mechanisms of how income inequality is linked to life satisfaction. Few studies have explicitly tested mechanisms that explain the inequality-happiness link. Oishi, Kesebir, and Diener (2011) examined longitudinal data from 1972 to 2008 in the United States and found that income inequality was linked to heightened perceived unfairness and lowered social trust, which in turn reduced happiness. Recent research suggests that income inequality may increase social comparison, which was associated with lower life satisfaction (Cheung & Lucas, in press; Walasek & Brown, 2015). These studies focused on explaining the negative effect of income inequality in developed societies and did not offer an explanation for why income inequality was sometimes linked to greater life satisfaction. The current study extends beyond existing research by examining the inequality-happiness link at the county level in China and testing a mechanism that may explain why income inequality can potentially be positive for life satisfaction in developing societies.

Income Inequality and Well-Being in China

Income inequality is pronounced in China. In the 1970s, income inequality in China (Gini ~ 0.30) was lower than that in the United States (~ 0.35), but in 2012, China (~ 0.55) surpassed

the United States (~ 0.45; Xie & Zhou, 2014). However, the association between income inequality and life satisfaction in China is less understood compared to westernized countries. In one study using survey data from 2002 to explore the predictors of life satisfaction in rural China, Knight, Song, and Gunatilaka (2009, p.644) "produced a surprising result" – higher income inequality was associated with greater life satisfaction in rural China. The surprising finding can plausibly be explained by hope. Hirschman and Rothschild (1973) posited that the present and future financial states both have implications on subjective well-being. In developing societies experiencing economic growth, witnessing increased income in others may signal potential for upward mobility, thus increasing the hope that one's income may similarly increase. Having greater hope, in turn, leads to greater subjective well-being (e.g., Bailey, Eng, Frisch, & Snyder, 2007; Peterson, Ruch, Beermann, Park, & Seligman, 2007). However, if one's income does not increase following the increased income in others (e.g., long-term income inequality), that hope may eventually be lost. This model thus allows for different predictions for income inequality in different places.

Applying this line of reasoning to China, I propose that income inequality may be linked to life satisfaction differently in rural and urban China. On one hand, policies (e.g., the policy of "leave the land but not the countryside" which encourages development in non-agricultural sectors in rural areas) have been implemented to urbanize rural China and close the urban/rural income gap. Therefore, economic growth is likely to sustain or increase in rural areas. In rural areas, income inequality could mean that people have witnessed neighboring villages experience sharp increases in economic growth. While social comparison and unfairness may still play a role in the inequality-happiness link, the hope for greater income may help people tolerate the

negative effects of income inequality. The feeling of hope - that increased inequality could mean increase in income for oneself - may increase life satisfaction in rural areas.

On the other hand, economists have projected that the demographic changes that resulted from the one-child policy could lead to a plateau or even decrease in growth in urban areas. The one-child policy has led to a decreasing number of working age population, and as a result, the high rate of economic growth in urban China may not be sustainable (Cai & Lu, 2013). The feeling of hope may subside in urban areas where economic growth has slowed down but income inequality is high. In these areas, the positive and negative effects of income inequality may balance out and result in no change in life satisfaction. Therefore, I hypothesized that income inequality may not be significantly associated with life satisfaction in urban China.

The Current Study

The current study investigated the inequality-happiness link using a large Chinese sample. The current study aimed to: 1) replicate the earlier exploratory finding that inequality is linked to greater life satisfaction in rural China, 2) test the urban/rural divide as an important moderator of the inequality-happiness link, and 3) examine the mediating role of hope in the inequality-happiness link. The hypotheses were that 1) income inequality would be linked to greater life satisfaction in rural areas, 2) this association would be weaker in urban areas, and 3) hope would mediate the positive inequality-happiness link in rural areas. Elucidating the mechanism in the inequality-happiness link in developing areas not only furthers our theoretical understanding of income inequality and subjective well-being, but also addresses a pressing need given the sharp increase in inequality in China.

Method

Participants

Data were retrieved from the 2012 China Family Panel Studies (CFPS; Xie & Hu, 2014). CFPS were conducted by the Institute of Social Science Survey at Peking University. Sample size was determined by the number of participants collected by the CFPS. CFPS contains nationally representative data of 35,719 Chinese individuals from 247 counties interviewed using computer-assisted personal interviewing. Participants were excluded if they did not report their county, income, age, gender, education, employment status, marital status, hope, and life satisfaction. Since county-level median household income and Gini coefficients (a measure of income inequality) were estimated using in-sample data, counties with 20 or fewer respondents were excluded to ensure that county median income and Gini coefficients were not estimated based on small samples. These exclusion criteria resulted in a final sample of 30,255 participants (51.1% female) from 160 counties (5,464 participants excluded). As shown in Tables 1a & 1b, participants had an average age of 45.5 (*SD*=16.6), an average of 6.60 years of education (*SD*=4.94), and the majority of participants were employed (70.1%). In terms of marital status, 79.7% were married, 13.0% were single, 5.6% were widowed, 1.3% were divorced, and 0.4% were cohabitating.

Sample representativeness was assessed by comparing province-level average household income per capita between the CFPS data and the 2012 China Statistical Yearbook (CSY) released by the National Bureau of Statistics of China (2012; see Tables 1c & 1d).[1] The correlations of provincial income between CFPS and CSY were very high, $r(24) = .79$, $p < .001$, 95% CIs [.57, .90] in urban areas and $r(23) = .73$, $p < .001$, 95% CIs [.46, .87] in rural areas. Compared to CSY, CFPS respondents in urban areas had significantly lower income in 21 out of

[1] To protect the identity of the respondents, the CFPS data did not include the actual county codes respondents lived in. The county codes were renamed so that they cannot be traced back to official records. Therefore, representativeness was assessed at the provincial level.

Table 1a

Frequency Table for Categorical Variables

	Full Sample (*N*=30,255)		Urban (*N*=13,626)		Rural (*N*=16,629)		Excluded Participants (*N*=5,464)	
	n	%	*n*	%	*n*	%	*n*	%
Gender								
Women	15,456	51.1	7,078	51.9	8,378	50.4	2,842	55.5
Men	14,799	48.9	6,548	48.1	8,251	49.6	2,282	44.5
Marital Status								
Married	24,099	79.7	10,825	79.4	13,274	79.8	3,463	63.4
Single	3,943	13.0	1,739	12.8	2,204	13.3	1,642	30.1
Cohabitating	122	0.4	61	0.4	61	0.4	45	0.8
Divorced	404	1.3	266	2.0	138	0.8	74	1.4
Widowed	1,687	5.6	735	5.4	952	5.7	235	4.3
Employment Status								
Employed	21,195	70.1	8,619	63.3	12,576	75.6	2,066	37.8
Unemployed/ Not in Workforce	9,060	29.9	5,007	36.7	4,053	24.4	3,398	62.2

Table 1b

Descriptive Statistics of Continuous Variables

	Full Sample (*N*=30,255)		Urban (*N*=13,786)		Rural (*N*=16,629)		Excluded Participants (*N*=5,464)		
	M	*SD*	*M*	*SD*	*M*	*SD*	*n*	*M*	*SD*
Individual-level Variables									
Life Satisfaction	3.32	1.05	3.35	1.04	3.29	1.07	1,720	3.23	1.10
Hope	3.66	1.12	3.68	1.09	3.65	1.14	1,511	3.39	1.98
Household Income per Capita	11,800	20,440	15,900	28,160	8,450	9,261	4,191	11,320	10,578
Age	45.5	16.6	45.8	16.6	45.1	16.6	5,421	36.7	16.5
Years of Education	6.60	4.94	8.16	4.89	5.33	4.60	5,421	7.40	4.62
County-level Variables									
Gini	0.45	0.07	-	-	-	-	-	-	-
Median Household Income	8,840	5,082	-	-	-	-	-	-	-

Table 1c

Comparisons of average urban household income per capita between CFPS and CSY

Regions	CSY Mean	CFPS Mean	*SD*	*n*	*t*	*p*	Cohen's *d*	95% CIs	
								Lower	Upper
Beijing	32,903	32,410	31,456	169	-0.20	0.839	-0.02	-0.17	0.14
Tianjin	26,921	24,566	19,291	129	-1.39	0.168	-0.12	-0.30	0.05
Hebei	18,292	10,514	9,679	587	-19.47	<.001	-0.80	-0.58	-0.47
Shanxi	18,124	10,272	12,028	395	-12.97	<.001	-0.65	-0.71	-0.54
Liaoning	20,467	17,014	17,172	1,405	-7.54	<.001	-0.20	-0.25	-0.15
Jilin	17,797	11,911	13,429	334	-8.01	<.001	-0.44	-0.55	-0.33
Heilongjiang	15,696	14,532	26,129	727	-1.20	0.230	-0.04	-0.12	0.03
Shanghai	36,230	32,188	62,561	1,720	-2.68	0.007	-0.06	-0.11	-0.02
Jiangsu	26,341	14,433	13,163	462	-19.44	<.001	-0.90	-0.66	-0.53
Zhejiang	30,971	19,267	15,163	290	-13.14	<.001	-0.77	-0.82	-0.64
Anhui	18,606	12,435	10,008	348	-11.50	<.001	-0.62	-0.72	-0.50
Fujian	24,907	10,814	7,613	117	-20.02	<.001	-1.85	-1.31	-1.05
Jiangxi	17,495	10,293	10,542	157	-8.56	<.001	-0.68	-0.86	-0.51
Shandong	22,792	10,232	11,754	535	-24.72	<.001	-1.07	-0.61	-0.49
Henan	18,195	12,016	23,784	1,616	-10.44	<.001	-0.26	-0.31	-0.21
Hubei	18,374	12,355	10,125	319	-10.62	<.001	-0.59	-0.71	-0.47
Hunan	18,844	16,636	14,182	388	-3.07	0.002	-0.16	-0.26	-0.06
Guangdong	26,897	13,653	11,984	1,473	-42.42	<.001	-1.11	-0.37	-0.30
Guangxi	18,854	8,615	15,487	132	-7.60	<.001	-0.66	-0.85	-0.47
Chongqing	20,250	13,251	11,318	173	-8.13	<.001	-0.62	-0.78	-0.45
Sichuan	17,899	10,581	12,794	693	-15.06	<.001	-0.57	-0.54	-0.43
Guizhou	16,495	10,365	10,217	309	-10.55	<.001	-0.60	-0.72	-0.48
Yunnan	18,576	9,220	11,396	223	-12.26	<.001	-0.82	-0.93	-0.67
Shaanxi	18,245	13,580	18,436	305	-4.42	<.001	-0.25	-0.37	-0.14
Gansu	14,989	14,402	20,694	620	-0.71	0.480	-0.03	-0.11	0.05

Table 1d

Comparisons of average rural household income per capita between CFPS and CSY

Region	CSY Mean	CFPS Mean	*SD*	*n*	*t*	*p*	Cohen's *d*	95% CIs	
								Lower	Upper
Beijing	14,736	-	-	-	-	-	-	-	-
Tianjin	12,321	8,263	7,136	89	-5.36	<.001	-0.57	-0.79	-0.34
Hebei	7,120	8,008	8,212	1,165	3.69	<.001	0.11	0.05	0.17
Shanxi	5,601	8,511	7,977	939	11.18	<.001	0.36	0.30	0.43
Liaoning	8,297	9,571	9,446	1,421	5.09	<.001	0.13	0.08	0.19
Jilin	7,510	9,704	7,261	198	4.25	<.001	0.30	0.16	0.44
Heilongjiang	7,591	9,709	8,855	273	3.95	<.001	0.24	0.12	0.36
Shanghai	16,054	15,445	10,742	460	-1.22	0.224	-0.06	-0.15	0.03
Jiangsu	10,805	13,258	10,620	207	3.32	0.001	0.23	0.09	0.37
Zhejiang	13,071	13,703	13,618	228	0.70	0.484	0.05	-0.08	0.18
Anhui	6,232	9,637	7,361	290	7.88	<.001	0.46	0.34	0.58
Fujian	8,779	7,300	7,776	211	-2.76	0.006	-0.19	-0.33	-0.05
Jiangxi	6,892	8,394	7,645	493	4.36	<.001	0.20	0.11	0.29
Shandong	8,342	8,774	9,145	899	1.42	0.157	0.05	-0.02	0.11
Henan	6,604	8,337	8,275	2,093	9.58	<.001	0.21	0.17	0.25
Hubei	6,898	12,860	10,462	160	7.21	<.001	0.57	0.40	0.74
Hunan	6,567	10,148	14,029	472	5.55	<.001	0.26	0.16	0.35
Guangdong	9,372	8,255	6,841	1,071	-5.34	<.001	-0.16	-0.22	-0.10
Guangxi	5,231	7,791	13,206	432	4.03	<.001	0.19	0.10	0.29
Chongqing	6,480	6,597	5,327	103	0.22	0.824	0.02	-0.17	0.22
Sichuan	6,129	6,305	11,692	770	0.42	0.675	0.02	-0.06	0.09
Guizhou	4,145	5,982	5,074	690	9.51	<.001	0.36	0.28	0.44
Yunnan	4,722	7,249	7,312	716	9.25	<.001	0.35	0.27	0.42
Shaanxi	5,028	7,617	8,219	322	5.65	<.001	0.32	0.20	0.43
Gansu	3,909	7,221	9,331	2,927	19.20	<.001	0.35	0.21	0.26

25 provinces (average Cohen's d = 0.56, SD = 0.42, range = -1.85 - -0.02), and CFPS respondents living in rural areas reported significantly higher income compared to CSY in 19 out of 24 provinces (average Cohen's d = 0.16, SD = 0.24, range = -0.57 - 0.57). In the CFPS, income data were truncated at CN¥300,000 (i.e., a participant was entered as having an income of CN¥300,000 if she earned more than CN¥300,000) to protect the identity of participants. Because extremely rich individuals may be more likely to live in urban areas and because mean is more influenced by extreme observations, the truncation at CN¥300,000 in CFPS is a plausible reason that accounts for the medium-sized discrepancy in urban areas. In sum, the current study was based on a large Chinese sample across 160 counties from 25 provinces, but the sample was not fully nationally representative in terms of income.

Demographic differences between the included and excluded participants were examined using chi-square tests for categorical variables and Welch's t-tests for continuous variables. Given the large sample sizes, small differences may be statistically significant. The differences between the sample included in the analysis and excluded participants were evaluated using φ or Cramer's V for categorical variables and Cohen's d for continuous variables. A φ or V of 0.1, 0.3, and 0.5 and a d of 0.2, 0.5, and 0.8 were considered as small, medium, and large effects, respectively (Cohen, 1988). Excluded participants were more likely to be women ($\chi^2(1, N=35{,}379) = 74.9$, $p < .001$, $\varphi = 0.05$, 95% CI [0.04, 0.06]), less likely to be married ($\chi^2(4, N=35{,}714) = 1048.3$, $p < .001$, Cramer's $V = 0.17$, 95% CI [0.16, 0.18]), and less likely to be employed ($\chi^2(1, N=35{,}719) = 2117$, $p < .001$, $\varphi = 0.24$, 95% CI [0.23, 0.25]). Excluded participants tended to have lower life satisfaction ($t(1903.7) = 3.16$, $p = .002$, $d = 0.08$, 95% CI [0.03, 0.13]), lower hope ($t(1558.6) = 5.36$, $p < .001$, $d = 0.14$, 95% CI [0.09, 0.19]), and lower household income ($t(9303.7) = 2.43$, $p = .015$, $d = 0.04$, 95% CI [0.01, 0.07]). They were

younger ($t(7592.4) = 36.21$, $p < .001$, $d = 0.08$, 95% CI [0.05, 0.11]) and more educated ($t(7811.1) = -11.61$, $p < .001$, $d = 0.08$, 95% CI [0.05, 0.11]). Although there were statistically significant differences between the included and excluded participants, all comparisons had small effect sizes ($\varphi/V = 0.05 - 0.24$; $d = 0.04 – 0.14$).

Statistical Power

The current study examined a sample of 30,255 participants (level-1; individual-level) nested within 160 counties (level-2; county-level) using multilevel modeling. The primary goal was to test the association between income inequality (level-2) and life satisfaction in rural and urban (level-1) China. Therefore, the associations of interests were cross-level. Mathieu, Aguinis, Culpepper, and Chen (2012) developed a Monte Carlo tool to estimate statistical power for cross-level effects in a multilevel context. Using an alpha of .05 and 1,000 Monte Carlo replications, the current study has over 99% power in detecting small effect sizes. Details of the power analysis can be found in the online supplementary material.

Measures

Individual-level variables. Life satisfaction was measured by asking participants “How satisfied are you with your life?” on a 5-point scale from 1 “very dissatisfied” to 5 “very satisfied.” Previous research has showed that single-item measures of life satisfaction have satisfactory reliability and validity (Cheung & Lucas, 2014; Lucas & Donnellan, 2012). Hope was measured by asking participants “To what degree are you confident about your future?” on a 5-point scale from 1 “Not confident at all” to 5 “Very confident.”

CFPS classified participants as residing in either urban (n = 13,626; 45%) or rural (n = 16,629; 55%) areas based on the definition set forth by the Chinese Census Bureau, and this variable on urban/rural classification was used to capture whether participants lived in rural or

urban areas. In addition, participants reported their gender, age, years of education, household income (log-10 transformed), marital status, and employment status, which were included as covariates.

County-level variables. Median household income by county (log-10 transformed) was obtained based on in-sample household income data to use as a proxy for the economic strength of different counties. Income inequality was operationalized as Gini coefficients, and they were computed based on household income per capita using the reldist package in R (Handcock, 2015; Handcock & Morris, 1999). Gini coefficients ranged from 0 to 1, where 0 represented complete equality (i.e. every earned the same amount of income) and 1 represented complete inequality (i.e., one person earned all the income and everyone else earned no income). Gini in the entire CFPS sample was .51. Gini coefficients by county (*M*=.45, *SD*=.07) were also computed.

Results

The aims of the analyses were to examine the associations between income inequality and life satisfaction in rural and urban China and test the mediating role of hope in the inequality-happiness link. Table 2 presents the zero-order correlations among the continuous variables. Multilevel modeling was used to test the hypotheses because respondents (Level-1; individual-level) were nested within counties (Level-2; county-level). Analyses were carried out using the lmer and lmerTest packages in R (Bates, Maechler, Bolker, & Walker, 2015; Kuznetsova, Brockhoff, & Christesen, 2014). As a first step, a random intercept model with life satisfaction as the dependent variable, county as the group variable, and no predictors was estimated to compute intraclass correlation. The intraclass correlation was .048, suggesting that 4.8% of the variance in life satisfaction was explained by the counties in which the respondents

Table 2

Zero-Order Correlations among Continuous Variables

N=30,255		2	3	4	5	6	7
1. Life Satisfaction	Pearson's r	0.427***	0.011	0.061***	0.021***	0.043***	0.016**
	p-value	< .001	0.066	< .001	< .001	< .001	0.004
	Upper 95% CI	0.437	0.022	0.072	0.032	0.055	0.028
	Lower 95% CI	0.418	-0.001	0.049	0.010	0.032	0.005
2. Hope	Pearson's r	—	0.013*	0.071***	0.023***	-0.212***	0.168***
	p-value	—	0.029	< .001	< .001	< .001	< .001
	Upper 95% CI	—	0.024	0.082	0.034	-0.201	0.179
	Lower 95% CI	—	0.001	0.060	0.012	-0.223	0.157
3. Gini	Pearson's r		—	-0.202***	-0.492***	-0.015**	-0.089***
	p-value		—	< .001	< .001	0.007	< .001
	Upper 95% CI		—	-0.191	-0.483	-0.004	-0.078
	Lower 95% CI		—	-0.212	-0.500	-0.027	-0.100
4. Household Income (log)	Pearson's r			—	0.405***	-0.038***	0.277***
	p-value			—	< .001	< .001	< .001
	Upper 95% CI			—	0.415	-0.027	0.288
	Lower 95% CI			—	0.396	-0.050	0.267
5. County Median Income (log)	Pearson's r				—	0.076***	0.289***
	p-value				—	< .001	< .001
	Upper 95% CI				—	0.088	0.299
	Lower 95% CI				—	0.065	0.278
6. Age	Pearson's r					—	-0.413***
	p-value					—	< .001
	Upper 95% CI					—	-0.404
	Lower 95% CI					—	-0.423
7. Years of Education	Pearson's r						—
	p-value						—
	Upper 95% CI						—
	Lower 95% CI						—

* p < .05, ** p < .01, *** p < .001

resided. Therefore, multilevel modeling is the appropriate method to account for the nonindependence in the data.

Analysis 1: The Association between Income Inequality and Life Satisfaction in Rural and Urban China

Next, I tested whether income inequality would be more strongly linked with life satisfaction in rural areas compared to urban areas. Specifically, Gini (county-level predictor; grand-mean centered), urban/rural classification (individual-level predictor; dummy coded using rural as the reference group), and the interaction between Gini and urban/rural classification (cross-level interaction) were entered as predictors in a multilevel model with life satisfaction as the dependent variable. Because rural was used as the reference group, the coefficient for Gini in this model represented the association between Gini and life satisfaction in rural area, and the coefficient for the interaction term represented how this association differed in urban area. This model was tested without (Model 1a) and with (Model 1b) gender, age, age^2, household income, years of education, marital status, employment status (individual-level), and median household income (county-level) as covariates. Continuous covariates – age, household income, years of education, and median household income – were grand-mean centered. Categorical covariates – gender, marital status, and employment status – were dummy coded, such that the largest groups were coded as reference groups (women, married, and employed).

Table 3 presents the results from the multilevel models. The results with and without covariates were largely consistent. Model comparison was conducted using a chi-square difference test, and the model with covariates was the significantly better model, χ^2 (11)=617.54, p<.001. In the following discussion, I focused on the model with covariates. The results on covariates were comparable to past studies (e.g., Cheung & Lucas, 2014; del Mar Salinas-

Table 3
Unstandardized Coefficients, Standard Errors (in parentheses), and 95% Confidence Intervals (in brackets) of the Multilevel Models

	Model 1a	**Model 1b**	**Model 2**	**Hope-as-Outcome**
Intercept	3.29***	3.25***	3.27***	3.62***
	(0.02)	(0.02)	(0.02)	(0.02)
	[3.25; 3.33]	[3.21; 3.29]	[3.24; 3.30]	[3.58; 3.66]
Main Predictors				
Individual-level				
Urban	0.03*	0.00	0.02	-0.02
	(0.01)	(0.02)	(0.01)	(0.02)
	[0.01; 0.06]	[-0.03; 0.03]	[-0.01; 0.04]	[-0.06; 0.01]
Hope			0.41***	
			(0.005)	
			[0.40; 0.42]	
County-level				
Gini	0.53†	0.77*	0.44	0.75*
	(0.28)	(0.30)	(0.24)	(0.30)
	[-0.03; 1.09]	[0.18; 1.36]	[-0.02; 0.91]	[0.16; 1.34]
Cross-level				
Gini X Urban	-0.51*	-0.48*	-0.31	-0.38
	(0.22)	(0.22)	(0.19)	(0.23)
	[-0.94; -0.08]	[-0.90; -0.05]	[-0.69; 0.07]	[-0.82; 0.06]
Covariates				
Individual-level				
Household Income		0.12***	0.08***	0.10***
(log)		(0.01)	(0.01)	(0.01)
		[0.09; 0.14]	[0.05; 0.10]	[0.07; 0.12]
Men		-0.08***	-0.10***	0.04**
		(0.01)	(0.01)	(0.01)
		[-0.11; -0.06]	[-0.12; -0.08]	[0.02; 0.07]
Age		0.003***	0.01***	-0.01***
		(0.0005)	(0.0005)	(0.0005)
		[0.00; 0.00]	[0.01; 0.01]	[-0.02; -0.01]
Age^2		0.0004***	0.0003***	0.0002***
		(0.00003)	(0.00002)	(0.00003)
		[0.00; 0.00]	[0.00; 0.00]	[0.00; 0.00]
Years of Education		0.01***	0.00	0.02***
		(0.002)	(0.001)	(0.002)
		[0.00; 0.01]	[-0.00; 0.00]	[0.01; 0.02]
Single		-0.06**	0.03	-0.22***

		(0.02)	(0.02)	(0.03)
		[-0.11; -0.02]	[-0.02; 0.07]	[-0.27; -0.17]
Cohabitating		-0.26**	-0.21*	-0.12
		(0.09)	(0.08)	(0.10)
		[-0.44; -0.08]	[-0.38; -0.05]	[-0.31; 0.07]
Divorced		-0.42***	-0.26***	-0.37***
		(0.05)	(0.05)	(0.05)
		[-0.52; -0.31]	[-0.35; -0.17]	[-0.48; -0.27]
Widowed		-0.17***	-0.08**	-0.20***
		(0.03)	(0.03)	(0.03)
		[-0.22; -0.11]	[-0.13; -0.03]	[-0.26; -0.15]
Unemployed/		0.04*	0.04**	-0.01
Not in Workforce		(0.02)	(0.01)	(0.02)
		[0.01; 0.07]	[0.02; 0.07]	[-0.04; 0.02]
County-level				
County Income (log)		0.05	0.01	0.09
		(0.09)	(0.07)	(0.09)
		[-0.13; 0.24]	[-0.13; 0.15]	[-0.10; 0.27]
Intercept Variance	0.05	0.05	0.03	0.05
Residual Variance	1.06	1.04	0.84	1.13
Log Likelihood	-43951.33	-43685.85	-40572.08	-44939.43
Model Comparison($\Delta\chi^2$)	-	617.54***	6240.40***	-

Note. *** $p < 0.001$, ** $p < 0.01$, * $p < 0.05$, † $p=0.064$. Life satisfaction was the outcome variable for Model 1 and 2.

Jiménez, Artés, & Salinas-Jiménez, 2011). For example, participants who were more educated and married reported significantly greater life satisfaction. Supporting Hypothesis 1, the results showed that in rural areas, higher Gini was associated with greater life satisfaction, b=0.77, SE=.30, β=.05 [.01, .09], p = .012. This replicates the surprising finding previously documented by Knight, Song, and Gunatilaka (2009), where income inequality was associated with greater life satisfaction. As predicted by Hypothesis 2, the link between Gini and life satisfaction was less positive in urban areas, b=-0.48, SE=0.22, β=-.03 [-.003, -.06], p = .029. Figure 1 presents the interaction between income inequality and urban/rural classification. A follow-up simple slope analysis for cross-level interaction was conducted (Preacher, Curran, & Bauer, 2006). Income inequality did not significantly predict life satisfaction in urban areas, b=0.29, SE=0.30, z=0.98, p=.33. In sum, higher income inequality was associated with greater life satisfaction in rural area, but this association was weaker and non-significant in urban area, supporting the hypotheses.

Analysis 2: The Mediating Role of Hope

Hope was hypothesized to mediate the association between income inequality and life satisfaction in rural area. To reiterate, in developing rural areas, diversity in income may signify opportunities for upward social mobility, thus increasing hope, which leads to greater life satisfaction. This hypothesis was tested using a multilevel mediation model with the coefficient of Gini (which represents the simple effect of Gini in rural areas) as the predictor, hope as the mediator, and life satisfaction as the dependent variable.

First, I examined whether income inequality was associated with greater hope in rural areas (the “a” path in mediation models; i.e. whether the predictor was associated with mediator). The same model from Model 1b (i.e. with covariates) was repeated with hope entered as the

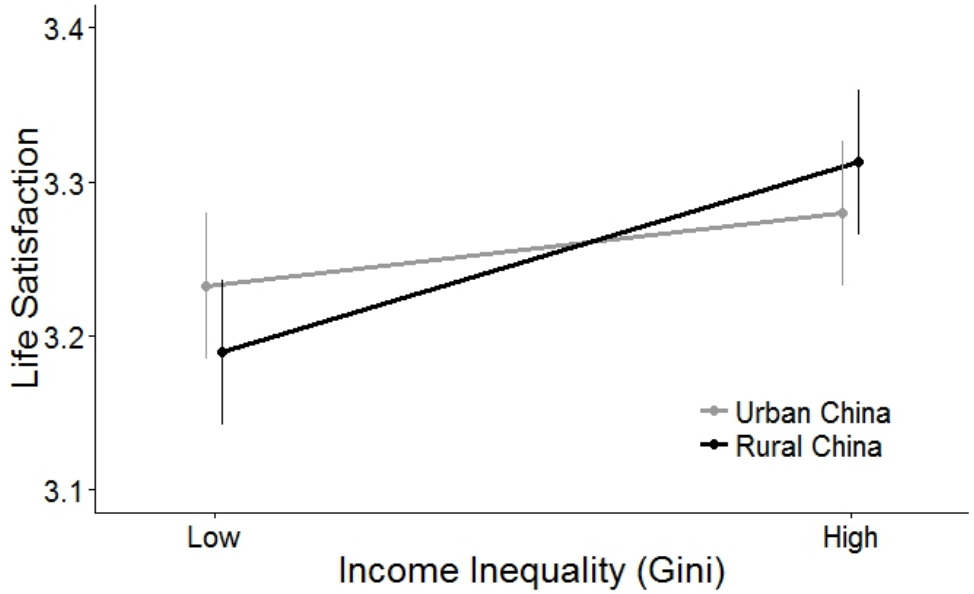

Fig. 1.
The Associations between Income Inequality and Life Satisfaction in Rural and Urban China. Low and high levels of Gini referred to 1SD below and above the mean, respectively. Vertical lines represent the 95% confidence intervals.

dependent variable (the “Hope-as-outcome” column in Table 3). In rural areas, participants living in places with higher Gini was associated with greater hope, b=0.75, SE=0.30, β=.05 [.01, .09], p=.013.

Second, hope was added to Model 1b (Model 2 in Table 3) to test whether greater hope was linked to greater life satisfaction (the “b” path in mediation models; i.e., whether the mediator was associated with the outcome). Model comparison using a chi-square difference test showed that including hope significantly improved the model, χ^2 (1)=6240.40, p<.001.Hopeful participants reported higher life satisfaction, b=0.41, SE=0.005, β=.44 [.43, .45], p<.001. After accounting for hope, the coefficient for Gini dropped from b=0.77 in Model 1b to b=0.44, SE=0.24, β=.03 [-.001, .062], p=.06, suggesting the possibility of an indirect effect.

Third, the indirect effect was tested using the Monte Carlo method for assessing mediation (Selig & Preacher, 2008). The indirect effect was the degree to which the positive association between income inequality and life satisfaction in rural areas was explained by hope. It is considered significant if the 95% confidence intervals (based on 20,000 Monte Carlo simulations) do not overlap with 0. Figure 2 presents the results from the mediation analysis. The indirect effect of hope was statistically significant (indirect effect = 0.31, 95% confidence intervals [.07, .55]) and accounted for 40.3% of the association between Gini and life satisfaction in rural areas. In other words, hope partially accounted for the positive inequality-happiness link in rural China.

Discussion

It is critical to understand how income inequality relates to subjective well-being in developing areas. China has faced increasing income inequality in recent decades and provides an interesting

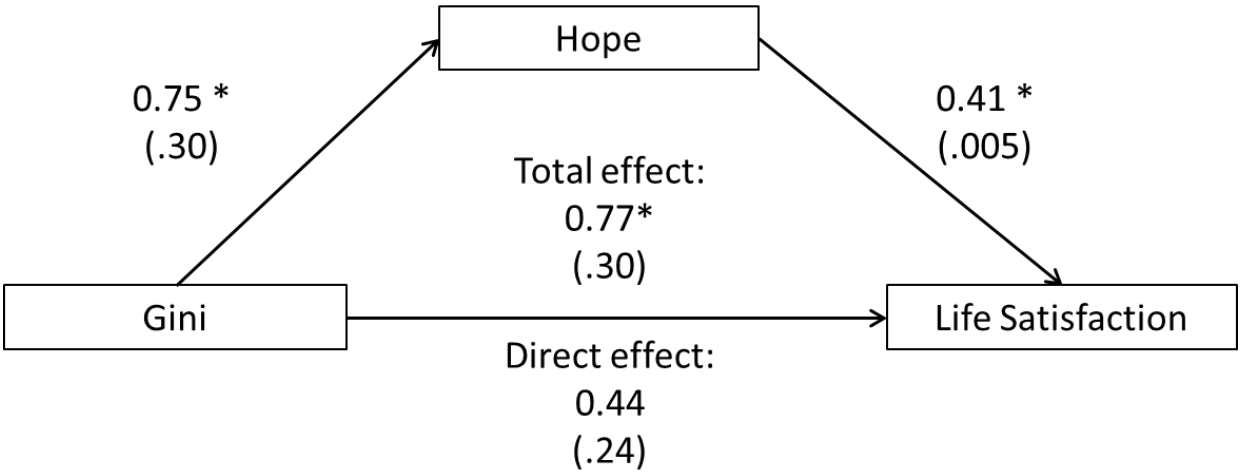

Fig. 2.
The Mediating Role of Hope in the Associations between Income Inequality and Life Satisfaction in Rural China. Unstandardized coefficients are presented with standard errors in parentheses. * $p<.05$

opportunity for research. Prior research has found a surprising positive association between income inequality and life satisfaction in rural China (Knight, Song, & Gunatilaka, 2009). I proposed that in developing rural areas, diversity in income may generate hope that one's income may eventually increase, which is beneficial to life satisfaction. The current study, to the author's knowledge, is the first study to empirically test a mechanism (i.e. hope) that explains the association between income inequality and greater life satisfaction. The hypotheses were tested by analyzing data from a large sample of 30,255 Chinese respondents from 160 counties in China. The results revealed three general findings. First, this study replicated the positive link between inequality and life satisfaction in rural China using more recent data from a larger sample of the country. Second, the study compared the difference in the links between income inequality and life satisfaction in urban and rural China. Finally, the findings explained the positive inequality-happiness link in rural China in terms of hope.

The results showed a positive association between income inequality and life satisfaction in rural China, providing support for the "surprising" finding that income inequality increased life satisfaction in rural China (Knight, Song, & Gunatilaka, 2009). In rural areas, respondents may have witnessed neighbors, friends, or relatives whose income increases quickly as a result of economic growth. While income inequality increased and certain rural residents were "left behind" from the economic growth, they may nevertheless have hope that their livelihood may be improved in the future.

Next, the results showed that the urban/rural divide in China was an important moderator of the association between income inequality and life satisfaction. Specifically, the association between income inequality and life satisfaction was weaker in urban China compared to rural China. A simple slope analysis showed that income inequality was not significantly associated

with life satisfaction in urban areas. In urban areas, as income inequality is prolonged and the hope of becoming rich subsides, the association between income inequality and life satisfaction weakened. Future research can explore whether there are other important moderators (e.g., cultural values such as individualism) of the association between income inequality and life satisfaction in addition to the urban/rural divide. For example, previous research (Talhelm et al., 2014) has argued that within China, there are two distinct cultures that originated from farming rice vs. wheat. Talhelm and his colleagues found that the rice-farming culture tended to be more interdependent, whereas the wheat-farming culture tended to be more independent. A plausible hypothesis is that people who are more interdependent (and thus, more connected to others) and live in rural areas may be more positively influenced by seeing friends and neighbors experience increases in income.

This study also found that hope mediated the association between income inequality and life satisfaction in rural China. Specifically, higher income inequality was associated with greater hope in rural China, and increased hope partially explained why income inequality was positively associated with life satisfaction in rural China. This cross-sectional result is consistent with a conceptual model where hope explains the link between income inequality and life satisfaction. To gain more confidence in this model, future research should use longitudinal analyses to test the causal chain that may lead income inequality to overall wellbeing. It would be particularly informative to examine individuals who moved residency to regions of different levels of income inequality and economic growth (e.g., Chinese workers who move from rural areas to urban cities).

In sum, these findings not only replicated a surprising positive relationship between inequality and life satisfaction in rural China, but also provided evidence for hope as the

underlying mechanism. Integrating the current findings with past research, a dual process model of income inequality may help explain the mixed results from research on the inequality-happiness link. Income inequality may simultaneously lead to greater hope and social comparison, and the extent to which hope and social comparison is elicited may depend on stages of economic development (see Figure 3). This dual process model explained the existing mixed findings on income inequality and life satisfaction. During early stages of economic development (e.g., rural China), some individuals' income increases whereas others remain relatively stable, and this creates income inequality. However, those whose income remains unchanged may see hope that they may soon experience similar growth, thus increasing life satisfaction. During intermediate stages of economic development (e.g., urban China), those who are lagged behind may lose hope because economic growth starts to stagnate. Income inequality may lead to a balance of hope and social comparison, resulting in no change in life satisfaction. Furthermore, in later stages of economic development (e.g., the United States; Cheung & Lucas, in press; Oishi Kesebir, & Oishi, 2011), social comparison and perceived unfairness may become a more dominant response over hope, and income inequality reduces life satisfaction. This dual-process model suggests that policies designed to reduce inequality may be beneficial in developed areas, but not necessarily beneficial (at least in terms of subjective well-being) in developing areas. Moreover, policies and interventions could target the psychological mechanisms underlying the inequality-happiness link by increasing hope or reducing social comparison. Therefore, future research should carefully consider the context in which income inequality is studied and take the stage of economic development into account.

The limitations of the current study should be noted. First, income inequality was estimated using in-sample data from the CFPS. Relative to CSY, CFPS respondents tended to

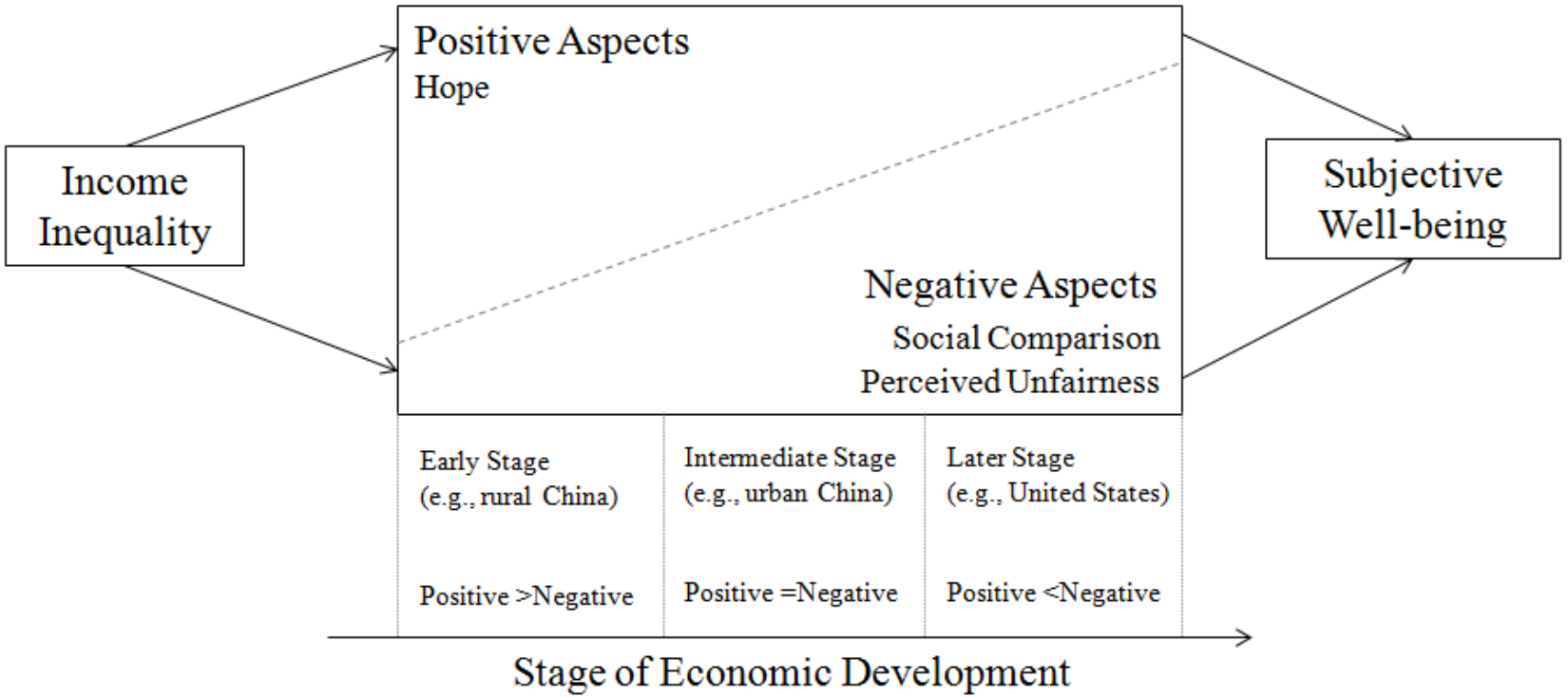

Fig. 3.

A Dual Process Model of Income Inequality.

have lower income in urban areas and higher income in rural areas. In other words, the urban/rural income gap was smaller in the CFPS sample compared to CSY, and this may have produced underestimates of Gini coefficients. It is noteworthy that the National Bureau of Statistics of China did not distribute information on county-level Gini coefficients. Therefore, given the very high correlations of income between CFPS and CSY, the current estimates of Gini using in-sample data may nevertheless represent the best estimate of county-level income inequality given existing data. Second, the measures used in the current study were designed to capture broad demographics and well-being in general, and they were not written specifically to test the link between income inequality and life satisfaction. For example, the current study used a measure of general hope, and it is plausible that the positive effects of income inequality may be more prominent using a measure of hope about future income or a measure of perceived upward social mobility. In addition to hope, including measures of perceived social status and unfairness would allow researchers to examine the relative importance of different mechanisms. Future research testing the effects of income inequality should include more targeted measures of hope, social comparison, and perception of fairness and injustice. Third, while examining the inequality-happiness link cross-regionally within a country had the advantage of minimizing cultural differences among respondents, this approach must be complemented by a cross-national (and preferably, longitudinal) approach to maximize the generalizability of the current findings. Future research using a cross-national approach should consider the role of cultural values to clarify the general and cultural-specific aspects of the inequality-happiness link.

To conclude, the current study investigated the inequality-happiness link in China where income inequality has risen drastically. Greater inequality was associated with higher life satisfaction in rural China but not significantly associated with life satisfaction in urban China,

and the positive inequality-happiness link in rural areas was partially explained by hope. By providing evidence for a mechanism through which income inequality could lead to greater well-being, the current study supported a dual-process model of income inequality in which inequality leads to higher or lower subjective well-being through hope and social comparison depending on economic development.

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