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Ways by which Comparable Income Affects Life Satisfaction in Hong Kong

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Abstract Proponents of social equality attribute low life satisfaction to income inequality in society, an inequality which occurs when most people have relatively low income and only a few have high income. In contrast, range-frequency theory and other social comparison theories predict that when most people have low income, they are satisfied because of the absence of relative deprivation among themselves. This prediction essentially suggests that that the size of the group of individuals with comparable income (i.e., income parity) sustains their life satisfaction. This theoretical prediction, however, does not consider their desire to be distinctive. By incorporating the notion of optimal distinctiveness, the size of income parity may have a quadratic effect on the individual's life satisfaction. This is a hypothesis that receives support from the present study in Hong Kong, China. The study finds a saddle point of income parity size associated with the lowest life satisfaction, other things being equal. Furthermore, middle-income individuals have income parity size equal to or above this saddle point. They would have higher life satisfaction with increased income parity size, which therefore leads to a more enlarged income inequality. Others, however, may have higher life satisfaction with reduced income parity size. Hence, reducing income inequality would have mixed effects on people with different levels of income.

Keywords Life satisfaction · Income inequality · Social comparison · Relative deprivation · Social identity · Optimal distinctiveness

1 Introduction

Income inequality is increasing in various industrialized regions in the world (Goesling 2001; Morris and Western 1999; Navarro 2002), and dissatisfied proponents of social

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equality have increasingly made efforts to advocate for the reduction of this inequality (Hicks and Kenworthy 2003). Notably in Hong Kong, a special administrative region of China, income inequality has escalated to a high level of .52[1] (Chan 2004; Estes 2005), spurring equalitarian proponents to press for the reduction of inequality and the eradication of poverty (Estes 2002). When comparing people who have the lowest income with those who have the highest income, poverty becomes an issue of concern. It also leads to the speculation that people with relatively low income are dissatisfied and suffering. However, simply stating that income inequality causes dissatisfaction among people with low income is theoretically questionable and in need of empirical verification.

The dissatisfying effect of income inequality is addressed in range-frequency theory, which implies that people are more satisfied with their incomes when the incomes are clustered at the low end of income inequality (Hagerty 2000; Parducci 1995; Wendell and Parducci 2000). Accordingly, income inequality occurs when many have low income and few have very high income. It leads to a distribution of income that statistically skews to the right or in a positive way, thus making income at any level more satisfying to the person who has it (Smith et al. 1989). The satisfaction supposedly arises from comparing with those having similar levels of income. This theory has rarely received direct support from research concerning income at the individual level and has attained very little support from research at a societal level (Diener and Fujita 1997; Diener et al. 1995). The theory may also be problematic in view of the counterargument that people prefer uniqueness and distinctiveness (Hornsey and Jetten 2004; Sheldon and Bettencourt 2002; Singelis 1994). This implies that having comparable levels of income causes dissatisfaction.

To reconcile these theoretical and empirical issues, the present study posits that comparable income affects an individual's life satisfaction in a quadratic way. It incorporates both preferences for similarity and uniqueness and employs theoretical grounds from various social comparison theories, including range-frequency theory, relative deprivation theory, social identity theory, and optimal distinctiveness theory. It aspires to elucidate the way by which individuals' income and others' comparable income affect one's life satisfaction, thereby shedding light on the impact of income inequality.

Studying the impact of income inequality is particularly pertinent in places with low tax rates, such as Hong Kong (Tang 2007), where people can regard income as a conspicuous indicator of social status and are willing to obtain cash income instead of non-taxable benefits. Moreover, large-scale redistribution of income is unlikely because of low tax rates, making income inequality a persistent issue (Holcombe 1985; Hood 1991). Meanwhile, the low tax rate leads to limited social welfare and benefits provided by the government, and this augments the importance of personal income. Hence, income is a normative status criterion for comparison among various status indicators (Merton 1948).

1.1 Social Comparison Theories Explaining Income Effects on Life Satisfaction

Common in social comparison theories is the human susceptibility to social comparison (Leventhal et al. 1997). Social comparison can have two independent and sometimes opposite functions of assimilation and contrast (Hogg 2000). They have opposite effects

[1] This is the Gini coefficient, which indicates the amount of deviation from the equal distribution. Mathematically, the coefficient represents an integration (a term in calculus) of the proportion of people and the people's deviation in actual cumulative income from ideal cumulative income based on the equal distribution.

when assimilation with similar individuals enhances life satisfaction, while contrast with others diminishes it. Nevertheless, they can have independent effects when assimilation represents conformity to a norm and contrast embodies the evaluation of the self in relation to other people. In this case, assimilation may embody informational influence, whereas contrast instills affective influence. Because of these separate functions, the impact of social comparison on life satisfaction is uncertain and is contingent on different specific theories of social comparison, range-frequency, relative deprivation, self-identity, and optimal distinctiveness.

Range-frequency theory most apparently specifies that both the absolute value of income in terms of range and the relative value of income in terms of frequency affect individuals' satisfaction with their income (Parducci 1995; Wendell and Parducci 2000). The notable impact of the relative position of income in terms of its percentile rank affects satisfaction through social comparison, including comparison with those having higher and lower incomes. When individuals have a relatively high income, they find that more people have lower income and few people have higher income compared to theirs. This case shows that downward comparison is more frequent than upward comparison and tends to be more satisfying. Hence, the frequency of downward comparison relative to that of upward comparison determines satisfaction. When individuals with lower incomes cluster together to have comparable incomes, they are more likely satisfied, considering that very few people have extraordinarily high income. In this distribution, individuals are likely to compare with those having similar levels of income and are unlikely to compare with those having very high income. As such, members of a community with a positively skewed income distribution appear to have higher life satisfaction (Hagerty 2000). This finding in the community is consistent with that found in the laboratory about the evaluation of activities (Smith et al. 1989). However, the effect of skewed distribution is not significant in the analysis of data at the country level (Diener et al. 1995). Such a discrepancy supports the claim of the range-frequency theory that the theoretical effect is contingent on a reference group that is similar or relevant to social comparison (Wendell and Parducci 2000). Despite the feasibility of a virtual community from a distance, the reference group is more likely physically close to the person than is mediated (Jepsen 2006; Lee and Nass 2002). Acquaintances that are physically and regularly visible are seemingly more influential than images shown on screen.

Relative deprivation ostensibly maintains that individuals with lower income would suffer from lower satisfaction when they compare themselves with those having higher income (Lavis and Stoddart 2003). The crux is that when this comparison leads to a sense of relative deprivation, dissatisfaction ensues. It means that relative deprivation depends on the reference group chosen for comparison (Tyler et al. 1997). A well-known example is that women are satisfied despite having lower income than men because they do not compare their income with that of men (Cheung and Scherling 1999; Crosby 1982; Crosby et al. 2002). Essentially, when individuals do not desire to have an income that is comparable to others, the comparison is deemed irrelevant in creating a sense of relative deprivation. On the other hand, when individuals who have comparable levels of income do not develop a desire to have higher income, the comparison would likewise not result in a sense of relative deprivation. In sum, the presence of comparable income means the absence of relative deprivation, which is satisfying to people with comparable income.

Social identity theory focuses more explicitly on similarity or group prototypicity as a precursor to self-esteem and satisfaction (Hogg 2000). As opposed to relative deprivation theory which accentuates discrepancy and contrast among individuals, social identity theory maintains that the pursuit of uniformity is the impetus for social comparison. As

such, individuals actively, or at least naturally, seek to compare themselves with others similar to them. Those with comparable incomes, not those of noticeably higher or lower incomes, are therefore favorable candidates for social comparison. Comparing with comparable incomes would be satisfying when it promotes a sense of social identity. Social identity theory therefore warrants a focus on the influence of people with comparable income, a topic which has not been an explicit research focus of range-frequency theory and relative deprivation theory. Apparently, the focus on the influence of those with comparable income would be a reinstatement of range-frequency theory when applied to comparison with others similar to them, rather than upward and downward comparison. This reinstatement, however, is not complete without incorporating the concern of optimal distinctiveness theory.

Optimal distinctiveness theory posits that a group that confers both senses of cohesiveness and uniqueness to the group member is most satisfying (Hornsey and Jetten 2004). This is because both social identity and self-identity are the things that the group member pursues. The theory, therefore, suspects that social identity is not always satisfying, as the person desires to be different from others. As such, people would sometimes prefer not to associate with others similar to them. Furthermore, feelings of being alone and independent can have therapeutic values that sustain the individual's worth (Yalom 1980). When both social identity and distinctiveness can be salutary, a way to reconcile the apparent paradox is in finding optimal ranges in which social identity and distinctiveness each generate their best contribution. This practice of optimization commonly resorts to a quadratic or curvilinear model of group influence, instead of the usual linear one. An example of a quadratic model is about person-environment fit, which serves to identify an optimal range for person-environmental fit to realize its impact (Edwards et al. 1998). This model is similar to the present case in searching for optimal ranges for which the presence of individuals with comparable income affects the individual's life satisfaction.

The present study is a pioneering effort to examine the quadratic effect of the size of individuals with comparable incomes on their life satisfaction based on a synthesis of various social comparison theories. Such an effect is worthy of investigation principally because of the lack of direct empirical examination, and secondarily because of the disagreement and suspicion about the relevance of social comparison (Diener and Fujita 1997). In the first place, while similar factors are preferred referents for social comparison (Tyler et al. 1997), comparable income has not been a focus to demonstrate the reverse case of relative deprivation. That is why the assimilative effect of social comparison has not received much research attention. Moreover, empirical and theoretical disagreements with the social comparison effect, which are mostly contrastive, tend to arise in view of the psychological process of adaptation. According to the disagreements, an individual can adapt to the threat of social comparison through selective attention, perception, and modification of comparison standards. This view holds that when individuals can choose whom to compare with, they are able to shield themselves from the influence of the comparison. The view is compatible with the notion of the hedonic treadmill, which explains that a person would not be more satisfied with increased rewards because of that person's escalating aspiration (Binswanger 2006; Diener and Lucas 2000). In the same manner, downward comparison of income is no longer satisfying when the individual raises the aspiration or the comparison standard for income. Given that such psychological processes may obscure the impact of social comparison, the objective fact of the size of individuals with comparable income would be appropriate for the study to avoid psychological contamination.

1.2 Hypotheses

Research hypotheses bearing on the assimilative effect of the size of individuals with comparable income are concerned with the linear effect and quadratic effect of the size. These are:

Hypothesis 1 (linear effect): Individuals have higher life satisfaction when more people have income comparable to what they have.

Hypothesis 2 (quadratic effect): Individuals have higher life satisfaction when either relatively few or relatively many people have income comparable to what they have. Conversely, individuals have lower life satisfaction when a modest number of people have income comparable to what they have.

While Hypothesis 1 is the adaptation of range-frequency theory to social identity theory, Hypothesis 2 adds the consideration of optimal distinctiveness theory. Both hypotheses necessarily rest on the tenet of social comparison theory, which posits that the individual compares his or her income with those of other people to derive satisfaction. In this connection, the hypotheses maintain assumptions that the presence of people with comparable income is germane to social comparison and this comparison results in satisfaction with life in general. The former assumption is viable in modern urban society where individuals can spontaneously interact, compare, and compete with many others (Hechter and Okamoto 2001). Hence, when individuals with comparable income are numerous, one cannot avoid meeting and possibly comparing their income. In this case, geographic proximity and segregation would have little relevance to social comparison in mass society, and this is consistent with findings about the insignificance of comparison with neighbors (Diener and Fujita 1997). Such is the case in Hong Kong, where high levels of urbanization and free flow within the territory essentially eradicate any geographic segregation. While previous research has noted the contribution of urbanization to the experience of relative deprivation (Walton and Ragin 1990; Zimmermann 1983), the present study assumes that urbanization facilitates social comparison in general and that its assimilative effect can be salutary. The salutary effect can apply to satisfaction with life in general because such satisfaction involves income as its essential component (Schyns 2000, 2001). This effect embodies the bottom-up approach to the formation of life satisfaction as an aggregate of satisfaction with various life domains (Kahneman 1999).

1.3 Relevance of the Study in Hong Kong

Hong Kong is a relevant place for exploring universalized knowledge because concerns about income inequality, social comparison, and life satisfaction are comparable to other modernized places in the world. Hence, income inequality is a rising issue noted in Hong Kong (Chan 2004; Estes 2005) as well as in the West (Goesling 2001; Morris and Western 1999; Navarro 2002). Assimilative social comparison and contrastive social comparison are also detectable in Hong Kong (Cheng 2004; Cheung et al. 2006) and the West (Locke 2003; Solberg et al. 2002). They are influential on the Hong Kong inhabitant's affective states and practice of filial piety. Furthermore, life satisfaction is a function of income in Hong Kong (Cheung and Leung 2002, 2004; Wan 1992) as well as in the West (Diener and Oishi 2000; Schyns 2001). Hong Kong also belongs to the category of places with high urbanization, globalization, and living standards (Jessop and Sum 2000; Overholt 2004;

Tsang 1999). Its capitalistic development allows it to manifest greater socio-cultural resemblance with the West than many other Chinese societies (Ng and Wong 1999; Wong 1995). Therefore, although Hong Kong is somewhat socio-culturally different from the West due to its Chinese heritage, its global position warrants the examination and generation of knowledge appealing to worldwide interest. At the same time, Hong Kong is an appropriate research site for examining theories prevailing in the West because it is not too different.

2 Methods

A survey of 1,008 Hong Kong citizens took place in early 2000. Respondents represented a random sample of the adult (aged 18 or above) population in Hong Kong, selected by a stratified random sampling procedure with the help of the Census and Statistics Department of the Hong Kong SAR Government. They responded to the survey through face-to-face interviews conducted by trained interviewers at their households.

The average age of respondents in the sample is 41.1 years and the average duration of residence in the city is 32.1 years (see Table 1). Unlike many countries, most (65.8%) of the Hong Kong residents do not have a religious faith. The occupation of respondents (Hagan and McCarthy 1997; Wright 1997) show that 29.6% belong to the surplus or nonworking class (i.e., homemakers and students; Hagan and McCarthy 1997), 26.6% belong to the working class (i.e., blue-collar, manual, and service workers), 18.3% belong to the middle class (clerical and disciplinary workers and supervisors of manual workers),

Table 1 Means and standard deviations

Variable	Scoring	*M*	*SD*
Satisfaction with economic life	0–100	47.1	15.5
Satisfaction with cultural life	0–100	57.6	14.1
Satisfaction with life as a whole (global life satisfaction)	0–100	54.7	23.5
Income per month (HK$7.8 = US$1)	HK$	11353.1	10556.2
Income percentile rank	%	75.1	14.5
Size within 10% higher in income	%	3.2	1.8
Size within 10% lower in income	%	3.5	2.2
Size within 10% higher and lower in income (income parity)	%	6.7	3.9
Female	%	52.7	50.0
Age	Years	41.1	15.5
Age of 60+	%	14.8	35.5
Duration of residence in Hong Kong	Years	32.1	13.4
Public housing resident	%	72.8	44.5
Welfare recipient	%	12.7	33.3
Not having religious faith	%	65.8	47.5
Working	%	55.6	49.7
Married	%	66.2	47.4
Divorced/separated	%	3.1	17.3
Education (primary or below = 1 … graduate school = 4)	1–4	1.9	.7
Social class (not working = 0 … bourgeoisie = 3)	0–3	1.0	.9

13.6% belong to the upper-middle class (i.e., professionals and managers), 6.2% belong to the underclass (i.e., unemployed over 1 year), and 3.1% belong to the owner class (i.e., employers and self-employed). The occupations thus identified four levels of social class, ranging from not working to the bourgeoisie.

2.1 Measurement

Measures of life satisfaction included those concerning economic life, cultural life, and life as a whole. They relied on five-level rating items with scores of 0 for the lowest level (i.e., very low), 25 for the second level (i.e., rather low), 50 for the third or middle level (i.e., average), 75 for the fourth level (i.e., rather high), and 100 for the highest level (i.e., very high) of satisfaction. Satisfaction with economic life was the average of four items, tapping personal finances, personal work conditions, local economic conditions, and local development (see Table 2). The composite reliability (α) was .668. Similarly, satisfaction with cultural life was the average of four items, involving relationship with the family, leisure activity, local cultural atmosphere, and community environments. The composite reliability (α) was .581. In contrast, satisfaction with life as a whole was a single rating item. These three dimensions of life satisfaction were distinguishable by means of confirmatory factor analysis (Muthen and Muthen 2006). This analysis showed that items of the three dimensions identified their respective factors exclusively to indicate convergence within a dimension and divergence between dimensions (see Table 2). This result was credible in view of the good fit of the factor model. Notably, the standardized root-mean-square residual was less than .041 and the root-mean-square error of approximation was less than .058 (Hu and Bentler 1999). Because the three measures all dealt with life satisfaction, they demonstrated correlations of .501, .517, and .606.

Income was a self-report measure in the survey covering work, social welfare, family members, and other sources. In contrast, the size of people with comparable and income percentile rank was calculated using the 0.1% bi-census database acquired from the Census and Statistics Department. This database included data from 6,615 respondents randomly selected from the 1996 bi-census. Because of the stagnant economic development after the 1997 Asian financial crisis, the bi-census data was relevant to 2001, with no need for adjustment for inflation or deflation. The size of people with comparable income or simply income parity referred to the proportion of people whose incomes were neither 10% higher nor 10% lower than that of the person under consideration. On average, a survey respondent had an income parity size of 6.7%, including 3.2% with 10% higher and 3.5%

Table 2 Factor loadings

Satisfaction	Economic	Cultural	Global
Local economic condition	.439		
Financial condition	.674		
Work condition	.682		
Local development	.457		
Local cultural atmosphere		.452	
Relationship with the family		.454	
Community environment		.523	
Leisure activity		.615	
Life as a whole			1.000

$L^2(25) = 92.7$, *RMSEA* = .058, *SRMR* = .041, *CFI* = .940

within 10% lower in income. This size varied radically from 0.1% to 11.6% (see Fig. 1). Besides, the average income percentile rank of the survey respondents had an average of 75.1%. This average rank was higher than the mid-point of 50 because the survey only included adults 18 years of age or older, whereas the bi-census included all inhabitants in Hong Kong. In addition, 12.7% of the respondents were receiving welfare (i.e., social security assistance) on a family basis.

2.2 Analytic Procedure

Linear regression analysis could examine the quadratic effect of the size of income parity by entering the square of this size variable as a predictor, together with other predictors. The whole set of potential predictors included age, an additional indicator about age of 60 or above, sex, education, duration of residence in Hong Kong, public housing residence, social class, welfare reception, religious faith, marital status, income, income percentile rank, and the size of income parity. Their presence in regression analysis at least served to reveal the net effects of income and income parity size, by controlling for background characteristics probably confounding the effects. Such confounding is possible in view of probable impacts of age on life satisfaction (Schulz et al. 2000; Sirgy 2001) and income (Zhou and Suhomlinova 2001), sex on life satisfaction (Stutzer and Frey 2006) and income (Folster et al. 2003; Zhou and Suhomlinova 2001), education on life satisfaction (Louis and Zhao 2002; Stutzer and Frey 2006) and income (Vartanian and McNamara 2004), social class (Kulik 2006) on life satisfaction and income (Zhou and Suhomlinova 2001), marital status on life satisfaction (Peiro 2006; Stutzer and Frey 2006) and income (Lee et al. 1999), and welfare reception on life satisfaction (Eaton et al. 2001; Grundy and Sloggett 2003) and income (Iceland and Kim 2001). The old age status (60+) can also have a unique influence on life satisfaction and income, as the age effect tends to be curvilinear (Zhou and Suhomlinova 2001). Furthermore, having religious faith tends to make a difference in life satisfaction and income because of the effects of religious faith on optimism and work ethic (Furnham 1997).

The use of linear regression analysis needed to minimize the trouble created by collinearity between predictors involving income, income percentile rank, income parity size, and its square. Because of the high correlation (.754) between income and income percentile rank, the regression analysis required the entry of either income or its percentile rank as a predictor. To minimize the collinearity between income parity size and its square in regression analysis, the square was used as a product of the standard score of income parity size. This square variable then had high scores for very high and very low income parity size, and low scores for medium income parity size.

Regression analysis proceeded with the first step focusing on the effect of income on life satisfaction, without consideration of income percentile rank and income size parity. The second step focused on the effects of income percentile rank and income size parity and its square instead of raw income. It served to test the proposed research hypotheses, as well as the propositions of range-frequency theory. The third step repeated the second step, using income parity of the upper bound (within 10% above) and lower bound (within 10% below) separately. This step explored any differences present due to the upper and lower bounds. The fourth step added interaction terms involving the square of income parity size, with each background characterized separately. It tested the variation in the impact of the square of income parity size across different levels of various background characteristics. Hence, it examined the effect of the square of income parity size held for people with

different background characteristics. Apart from predicting life satisfaction, the fifth step analyzed the impact of income on income parity size based on bi-census data. It completed analyses of linkages between income, income parity size, and life satisfaction.

3 Results

The first step of regression analysis of life satisfaction showed that income only had a weak positive effect (β = .089, see Table 3) on satisfaction with life as a whole. The effects on satisfaction with economic life and satisfaction with cultural life were minimal in a negative way. Controlling for personal income and other background characteristics, welfare reception exhibited consistently significant negative effects on all the three measures of life satisfaction. Thus, family financial conditions or poverty tended to affect life satisfaction. Furthermore, education, sex, age, old age status, and social class had significant effects on different aspects of life satisfaction. Notably, the older person enjoyed higher satisfaction with cultural life (β = .141).

The second step of regression analysis revealed consistently significant positive effects of the square of income parity size on all the three aspects of life satisfaction (see Table 4). This finding endorses Hypothesis 2. However, the insignificant effects of income parity size on the three aspects of life satisfaction refute Hypothesis 1. The findings involving income parity size indicated that life satisfaction tended to be lowest when income parity size was 6%, slightly below the average level of income parity size. Moreover, income percentile rank manifested a significant effect on satisfaction with life as a whole. This effect (.147) was stronger than that of raw income. The comparison indicates the importance of the frequency effect of income, as maintained in range-frequency theory. Welfare reception, education, age, and old age status again had significant effects on life satisfaction. However, sex and social class no longer displayed significant effects, reflecting the mediation of their effects by income percentile rank and income parity size.

The third step of regression analysis replicated findings from the previous step. Accordingly, the square of income parity size of the upper or lower bound was a significant predictor of all the three aspects of life satisfaction (see Table 5). However, income parity size was not a significant predictor of life satisfaction. These findings are in favor of Hypothesis 2 and against Hypothesis 1. They showed that comparison within the upper bound, lower bound, and both the upper and lower bounds engendered very similar effects on life satisfaction.

The fourth step revealed only two significant interactions with the square of income parity size out of the 42 interaction effects examined (see Table 6). The two significant interactions involved social class and working status, which had effects on satisfaction with economic life and satisfaction with life as a whole, respectively. They showed that the effect of the square of income parity size was higher for one in a lower class position or not working.

The fifth step showed that there was a decreasing trend of income parity size with the increase in income (see Table 7). Moreover, the plot of income parity size against raw income clearly unfolded a sharp "A" shape with a long right tail (see Fig. 1). This shape showed that income parity size quickly escalated to a peak level with increasing income at the lowest level, and then rapidly plummeted with increasing monthly income beyond HK$9,100. Hence, most of the income range had low income-parity size, and conversely, high and medium income-parity size concentrated on a narrow range of income. The 6% point of income parity size that generated the least positive effect on life satisfaction

Table 3 Standardized regression coefficients for predicting satisfaction

Predictor	Economic	Cultural	Global
Income	−.008	−.023	.089*
Age	−.016	.141*	−.064
Age 60+	.096	−.037	.131*
Female	.004	.036	.065*
Education	.078	.089*	.002
Duration of residence in Hong Kong	−.075	−.043	−.075
Public housing resident	.005	.012	−.005
Social class	.083*	−.006	.039
Welfare reception	−.084*	−.083*	−.085*
Having no religious faith	−.022	−.032	−.030
Married	.022	.068	.029
Divorced	.008	−.010	−.033
R^2	.018	.011	.020

Note: Reference categories were the male and neither married nor divorced

*$p < .05$; **$p < .01$; ***$p < .001$

Table 4 Standardized regression coefficients for predicting satisfaction

Predictor	Economic	Cultural	Global
Income percentile rank	.054	.050	.147***
Size of income parity (within 10% higher and lower)	.011	.046	.016
Size of income parity squared	.111**	.093**	.110**
Age	−.014	.137*	−.048
Age 60+	.102	−.019	.140**
Female	.000	.032	.063
Education	.062	.080*	.004
Duration of residence in Hong Kong	−.079*	−.048	−.079*
Public housing resident	.010	.014	−.009
Social class	.055	−.039	.004
Welfare reception	−.079*	−.070*	−.074*
Having no religious faith	−.024	−.035	−.033
Married	.015	.061	.024
Divorced	.011	−.007	−.028
R^2	.028	.019	.034

Note: Reference categories were the male and neither married nor divorced

*$p < .05$; **$p < .01$; ***$p < .001$

occurred at an income level of either HK$7,000 or $12,500. Increase or reduction of this income level would increase life satisfaction, according to findings from the analysis in the second step.

Table 5 Standardized regression coefficients of size of income parity for predicting satisfaction

Predictor	Economic	Cultural	Global
Within 10% higher			
Size of income parity	−.004	.036	−.002
Size of income parity squared	.106**	.080*	.086*
Within 10% lower			
Size of income parity	.005	.037	.011
Size of income parity squared	.098**	.072*	.090**

Note: The model controlled the same set of background predictors as in the previous one

*$p < .05$; **$p < .01$; ***$p < .001$

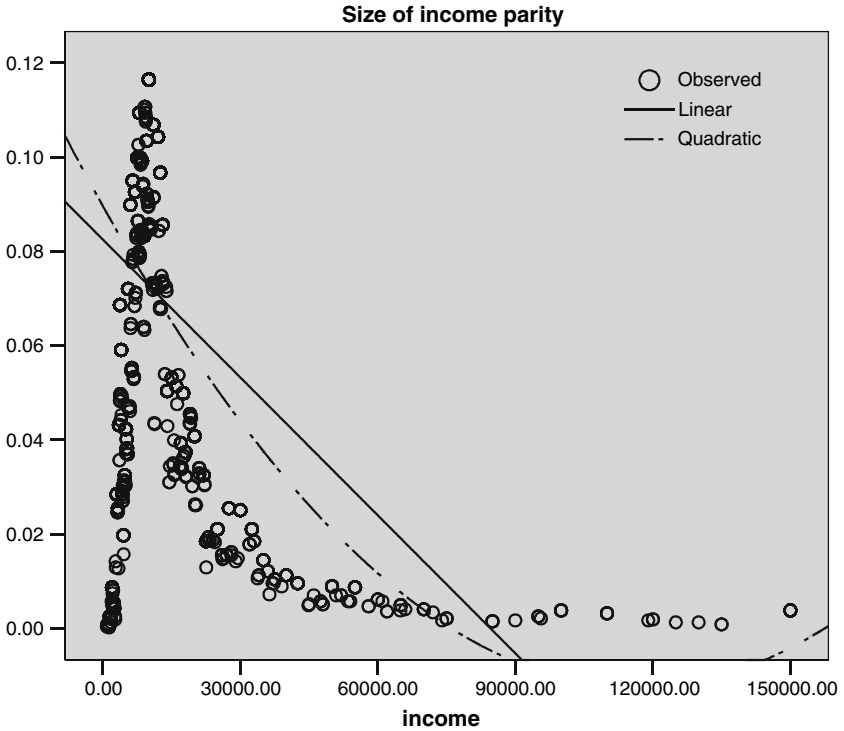

Fig. 1 Size of income parity against income

4 Discussion

Findings supporting Hypothesis 2 but not Hypothesis 1 contribute to a modification of the proposition based on range-frequency theory, by conjoining it with optimal distinctiveness theory. This modification did not overthrow range-frequency theory because it still sustains the relevance of the frequency effect in terms of income percentile rank and the square of income parity size. The frequency effect states that social comparison with more people

Table 6 Standardized regression coefficients of separate interactions with the size of income parity squared for predicting satisfaction

Interaction with the size of income parity	Economic	Cultural	Global
Income	−.038	.001	−.016
Income percentage rank	−.032	.021	−.020
Age	.011	−.022	.007
Age 60+	−.007	−.013	.004
Female	−.008	−.009	.026
Education	−.029	−.004	.008
Duration of residence in Hong Kong	−.006	−.046	−.030
Public housing resident	.024	.028	.040
Social class	−.093**	−.034	−.066
Working	−.052	−.027	−.070*
Welfare reception	.046	−.007	.014
Having no religious faith	.012	.030	.017
Married	.012	−.021	.046
Divorced	−.083	.005	−.100

Note: Reference categories were the male and neither married nor divorced

*$p < .05$; **$p < .01$; ***$p < .001$

Table 7 Regression coefficients for predicting the size of income parity

Predictor	Metric			Standardized		
	Within 10% higher	Within 10% lower	Both	Within 10% higher	Within 10% lower	Both
Income ('0000)	−.496	−.479	−.975	−.429	−.387	−.438
R^2				.184	.164	.192

Note: Regression coefficients were significant at $p < .001$ level

engenders a greater impact on life satisfaction. Essentially, comparison with more people with comparable income would lead to either greater increase or greater decrease in life satisfaction, depending on whether the income parity size is above or below 6%. When income parity size is above 6%, its further increase would promote life satisfaction. Conversely, when income parity size is below 6%, its further increase would diminish life satisfaction. When translated to income level, the critical point of 6% income parity size had an income of HK$7,000 or $12,500. Increasing income above this point or decreasing income below this point would raise life satisfaction by comparing income with people with comparable income. These different impacts above and below the critical point of income or income parity size signifies the need for optimal distinctiveness theory to complement range-frequency theory, when applied to people with comparable income. They show that the size of income parity can reduce the experience of relative deprivation and thus promote life satisfaction when it is small or large, but not when it is medium. In the extreme, the findings suggest that having no social comparison with those having comparable income can maintain a high level of life satisfaction. This tends to support the view on the irrelevance of social comparison. However, another part of the findings

purports that making a comparison with many people with comparable income would be salutary, and this endorses the relevance of social comparison. These findings thus reconcile both the supportive and unsupportive views about the impact of social comparison by highlighting the curvilinear effect of social comparison.

The findings reasonably reflect social comparison processes involving assimilation with similar others, social identity formation, maintaining optimal distinctiveness, and the frequency of social comparison. The frequency process is evident in the effect of income percentile rank and the square of income parity size. Essentially, the effect of income percentile rank on satisfaction with life as a whole is stronger than the effect of raw income, which is not a comparative measure. Social comparison likely represents the underlying mechanism for the generation of the findings under conditions that social interaction is frequent and influential (Gartrell 2002; Olson and Roese 2002) and that people are uncertain about their status of income (Leventhal et al. 1997). These conditions hold in modern urban societies simply because the high population density heightens people's interaction in public places and activities (Wollebaek and Selle 2002). Meanwhile, technological advancement and the complication of social structure accompanying modernization and the emergence of risk society have left people with more uncertainties than before (Robert and Bukodi 2005). With regard to the worth of income, people are uncertain about what income can bring to them and their life satisfaction materially and socially because of the differentiation of goods and services (Ashley 1997; Crook et al. 1992). For instance, they are uncertain of whether or not their income can help them attain aesthetic gratification treasured in contemporary society (Bauman 2005).

The prevalence of social comparison does not imply that comparing with people having comparable income is necessarily salutary. By modifying the proposition of range-frequency theory, findings endorse salutary effects for both high and low levels of income parity size. The favorable effect of having numerous individuals with comparable income suggests that the concentration of those with low income contributes to life satisfaction. Because the concentration reflects income inequality and a positive skew in income distribution, this finding suggests that income inequality does not necessarily make people with low income less dissatisfied with life. The finding therefore supplements findings about the positive effect of the positive skew in income distribution at the community level on the resident's life satisfaction (Hagerty 2000). It is also consistent with observations about the contribution of income inequality to life satisfaction measured at a national level (Diener and Oishi 2000; Mookerjee and Beron 2004). Moreover, findings show that people with the smallest income parity size also had higher life satisfaction, whereas people with medium income parity size had lower life satisfaction. As people with the smallest income-parity size have either very low or very high income, income inequality did not tend to dissatisfy people with lowest incomes, just as it did not hurt people with highest incomes. In contrast, people with middle income, who had medium size income parity, appeared to be disadvantaged by income inequality. Although these people do not have the lowest income, they might experience relative deprivation when their incomes do not gratify their high aspiration. Apparently, middle-income people may raise their aspiration to acquire more income and thus outperform others due to their success to have higher income than others (Wilson 1989). They would experience relative deprivation when their income is not substantially higher than others' income. Relative deprivation appears to be responsible for middle-income people's social discontent in Chinese societies, (Robison and Goodman 1996) as well as in other societies (McVeigh and Smith 1999; Opp 1989).

The impact of the square of income parity size generally held true for people with different background characteristics. As such, optimally distinctive social comparison

tends to enhance various individuals' life satisfaction. The exception is that such a social comparison effect is occasionally stronger for non-working or lower class than higher class individuals. This finding tends to indicate that nonworking or lower class individuals are more uncertain about the relative worth of their income, and are therefore more concerned with social comparison. Their uncertainty arises from the unlikelihood of securing a regular paying job. Just as uncertainty is a cause of social comparison (Hogg 2000; Leventhal et al. 1997), it accentuates receptivity and susceptibility to the assimilative or contrastive influence of social comparison. However, this possible moderating effect of uncertainty on the social comparison effect is in need of further research.

4.1 Further Research

To ascertain the veracity and generality of the present findings, further research is necessary to investigate the social comparison process among individuals of diverse sociocultural characteristics. Further research is required to supplement or elaborate the present study by highlighting the social comparison process explicitly starting from social interaction to making assimilation or contrast from social comparison. To avoid the bias of subjective perception, objective measurements through observation and other studies' reports are desirable to supplement and triangulate self-report measurements of the social comparison process. Alternatively, experimental design and manipulation can assign people to social comparison conditions to reveal at least the short-term effect of social comparison in a controlled setting. Variables for explicit measurement or manipulation will include the size of income parity, length of social interaction, and urges for assimilation and contrast in social comparison. Fostering a social identity involving the sense of similarity, prototypicity, and identification with and categorizing oneself in the income parity group are possible means to manipulate assimilation (Hogg 2000). Conversely, accentuating one's concern for the self and distinction from others will be a means to manipulate contrast in social comparison (Brewer and Chapman 2003). Further research can also examine the contribution of the person's uncertainty about income as facilitating and moderating factors of social comparison.

Apart from clarifying the generality of the social comparison effect across people with different personal characteristics, further research is desirable to tap the sensitivity of the social comparison effect to variations in sociocultural contexts. Further research is likewise needed to incorporate people with Western or individualist backgrounds in order to ascertain that the assimilative effect is unique in a society with Chinese or collectivist backgrounds or universal regardless of sociocultural constraint. Collectivism and individualism presumably affect assimilation, contrast, optimal distinctiveness, and desire for social identity (Crosby et al. 2002; Hornsey and Jetten 2004; Ohbuchi et al. 1999). For instance, distinctive orientation is more compatible with individualist culture than collectivist culture. Structural factors such as population and residential density that potentially affect social interaction, comparison, and their impacts (Triandis 1995; Wollebaek and Selle 2002) are also worthy of investigation. Additionally, further research needs to examine how the taxation structure of a place affects the significance of income and its inequality for life satisfaction. It is essential to tap the generality of the findings obtained from a low-taxation economy to areas with higher taxation.

As the reference group is a key in the social comparison influence, further research needs to examine how the choice of the reference group affects life satisfaction. Individuals with similar levels of income are the important reference group for examination.

Research needs to compare the impact of such a reference group to another that is composed of the very rich or those having remarkably higher income. Further research can also identify the individual's choice of reference group in order to verify similarity as a criterion for choosing the reference group and susceptibility to its influence. In this regard, research can assess how far mediated images serve as a reference group and compare its influence with that of a physically close reference group.

4.2 Implications

Reducing income inequality in society is not necessarily the key to maximizing an individual's life satisfaction. A more effective strategy is to change the size of income parity by increasing and decreasing income selectively. The selection is contingent on a saddle point at which comparison with comparable income has the least contribution to life satisfaction. In the present study, this saddle point is about 6% in income parity size. The strategy is to raise the size above or drop it below this saddle point by changing income spacing among people. Moreover, income parity size has a close relationship with income, such that the 6% point corresponds to a monthly income of HK$7,000 or $12,500. This income level can then be a focus for changing the size of income parity. If the chosen strategy is to increase the size of individuals with comparable income at that level, it would increase concentration of the corresponding income parity and thus further enlarge income inequality in society. It suggests that enlarging income inequality can be a way to increase life satisfaction of people with medium income. For people with a monthly income between HK$7,000 and $12,500, the strategy would be to increase income parity size further, as their size is already above the 6% level. This strategy would again enlarge income inequality. For people with a monthly income below $7,000 or above $12,500, the strategy would be to reduce income parity size by spacing out people's incomes because their income parity size is already below the 6% point. Reducing low-income individuals' income parity size would diminish income inequality, but reducing high-income individuals' income parity size would enlarge income inequality because it makes the income more outstanding. With the use of different strategies for people in different income categories, the combined result in overall income inequality is not readily predictable. Hence, reducing income inequality is unlikely to be a useful guide for promoting life satisfaction. Conversely, pursuing the goal of income equality does not necessarily sustain the life satisfaction of people in general and those with middle income in particular.

Raising income in either a selective or wholesale way also does not improve the individual's life satisfaction, at least appreciably. On the one hand, the effect of income on life satisfaction is limited. Even though the individual would be more satisfied with selected increase in income, this increase may have a profound effect on income distribution and the size of income parity, making the resultant effect on life satisfaction not readily perceptible. This uncertainty emerges because the effect of income increase on income distribution is contingent on the original level of income in a subtle way. On the other hand, a blanket increase in income would not raise life satisfaction through the means of social comparison. This is a case of the hedonic treadmill which maintains that a blanket increase in income does not alter income parity size that supports the assimilative or contrast effect.

Nevertheless, raising income selectively for low-income families would promote life satisfaction indirectly by ending their welfare status. In this connection, staying away from welfare is a more consistent predictor of life satisfaction than life satisfaction by itself.

Encouraging welfare recipients to leave the welfare roll by raising their earned income is a viable means to increase their life satisfaction. The means is consistent with the work activation strategy to reduce welfare recipients' dependency on social welfare (Hutton 2006). This strategy and the present finding suggest that the way to raise income and life satisfaction is resorting to work rather than welfare.

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