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The role of social capital in subjective quality of life

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This paper investigates the role of social capital (SC) in subjective quality of life to address the limitations of existing observable indicators as evidence for public policy. We use a large-scale survey of 100,956 respondents across 37 countries, including both developed and less developed countries. The empirical results suggest that higher SC is more strongly associated with better subjective health and higher satisfaction in low-income countries than in high-income countries. Moreover, while low-income countries show a lower level of perceived economic inequality at the community level with higher SC, high-income countries present a higher level. We further find that higher levels of educational attainment increase the perception of economic inequality and that this impact decreases with SC. Enhancing SC may lead to improved quality of life in most low-income countries, and lifestyle and cultural factors also play a crucial role. These findings indicate that noneconomic factors underpin better lives, and further research is needed to address the social aspects of life.

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Introduction

Quality of life is a social indicator that originated in economics and sociology. Although the concept of quality of life comprises two dimensions, subjective and objective quality of life or well-being, monetary aspects of social development typically capture only objective measures of well-being (Sirgy, 2021). For instance, economic well-being is measured by income, environmental well-being is measured by carbon dioxide (CO₂) emissions, and health-related well-being is measured by average life expectancy. However, objective indicators are necessary but not sufficient to understand and capture the true nature of community well-being (Liao, 2009). Quality of life mainly comprises four relevant domains: physical, material, social, and emotional well-being (Felce and Perry, 1995). In the last two decades, subjective aspects of quality of life have emerged in the field of study in the social, behavioral, and environmental sciences from policy perspectives (Yuan et al., 2018; Christian et al., 2020; Mouratidis, 2021).

SC has received considerable attention as a socioeconomic variable in the literature on environmental, economic growth, and social welfare (Won et al., 2017; Thompson, 2018; Imbulana Arachchi and Managi, 2022). With the development of social determinants of quality of life, the role of SC in quality of life has been recognized (Christian et al., 2020). Therefore, emerging studies on the social aspect have considered the role of SC in subjective quality of life. SC usually includes a cognitive and a structural aspect (Putnam, 2000): the cognitive aspect refers to individuals' predisposition to act in a way that is beneficial for society, while the structural aspect refers to the interaction among individuals (Kaasa and Parts, 2008).

Subjective indicators of quality of life mostly involve measuring individuals' level of satisfaction with life as he or she experiences it (Lee, 2008). Individuals' life satisfaction can be measured by considering various aspects of their experiences, such as social life, personal health, living environment, wealth, and working life. For instance, a landmark conceptual study on measures of quality of life clearly identified indicators of two dimensions of quality of life (Felce and Perry, 1995). Previous research has found that SC is positively correlated with subjective quality of life with regard to health and life satisfaction. Herian et al. (2014), Christian et al. (2020), and Elgar et al. (2011) examined the relationship between self-reported SC and health. Portela et al. (2013), Puntischer et al. (2015), Hoogerbrugge and Burger (2018) Christian et al. (2020), and Li et al. (2021) investigated the link between SC and life satisfaction. This study adds to prior studies that have examined the impact of SC on subjective quality of life by considering three main factors: self-reported life satisfaction and health, and perceived economic inequality in terms of individuals' experiences. Although these three domains are related to people's physical and mental health (Efklides, 2003; Maher et al., 2013), most scholars have considered only one domain to measure the subjective quality of life. Furthermore, current studies on SC and subjective quality of life have been based in developed countries, but few studies have been conducted in developing countries. Therefore, this study differs from previous studies by covering both developed and less developed countries on all continents and provides a comparison between these two country groups using a multinational survey comprising 100,956 respondents across 37 countries.

The remainder of this paper is organized as follows. The "Data and methodology" section describes the sample, variables, and model. The "Results" section presents the model results in tables and graphs. Finally, the "Discussion and conclusion" section discusses the main findings in comparison with the literature and shows the main conclusions of this paper.

Data and methodology

Data. The present cross-sectional study used data from a multinational survey that was designed to collect information on people's self-reported well-being and socioeconomic factors and that covered 37 developed and developing countries across all continents and included 100,956 respondents (Chapman et al., 2019). The countries were chosen based on the survey company's ability to collect data and our budgetary constraints. After the goal was established to collect data from each country's population age and gender categories, respondents were randomly selected nationwide. In each country, the survey was conducted for one month between June 2015 and March 2017 using both internet and interview survey approaches. A web-based survey approach was used in 32 countries; however, this approach could not be used in the remaining five countries, so a face-to-face survey was used. The sampling method was similar for both groups of countries. We carefully assessed the surveys to ensure the accuracy of responses through translations and multiple checks by native survey administrators. A summary of the survey method and the survey period for each country is displayed in Table S1.

Measures. Subjective quality of life is an individual's perception of his or her own life in terms of physical, material, and emotional well-being (Felce and Perry, 1995). These three types of well-being comprise several domains. Therefore, this study covered all three domains of well-being, each representing one variable. For instance, rather than measuring the subjective quality of life as a single term, as in previous studies, in this study, physical well-being was represented by one's health, material well-being was represented by perceived economic inequality, and emotional well-being was represented by life satisfaction. Thus, subjective quality of life was measured by three variables, namely, self-reported life satisfaction and health, and perceived economic inequality, and those three variables were considered dependent variables in this study.

Life satisfaction was assessed by one item asking how satisfied the respondent was overall with his or her life. Self-reported health and perceived economic inequality were also assessed by one item that asked, how the respondent would describe his or her overall state of health and what item appropriately described his or her perspective on perceived economic inequality in the local community. All three variables were assessed using a single item based on a previous study conducted among the general public (Imbulana Arachchi and Managi, 2021; Werner et al., 2013).

These variables were measured on a five-point scale ranging from "completely dissatisfied" to "completely satisfied" (for life satisfaction), "very poor" to "very good" (for health), and "does not exist" to "very high" (for economic inequality). For comparability with previous studies (Jen et al., 2010; Meng and Chen, 2014), we reclassified these three categorical variables to form dichotomous outcomes, where 1 represented life satisfaction (slightly satisfied or completely satisfied), good health (good or very good) and large economic inequality (slightly high or very high), while 0 represented dissatisfaction (completely dissatisfied, slightly dissatisfied or neither), poor health (very poor, poor or neither) and not high inequality (does not exist, not so high or average) for life satisfaction, health condition, and economic inequality, respectively.

In terms of the independent variables, SC was the key variable of interest. As a concept, SC is commonly defined as "the features of social organization, such as civic participation, norms of reciprocity, and trust in others, that facilitate cooperation for

Table 1 Descriptive statistics for individual- and country-level variables.

| Variables | Statistics |
|---|---|
| <i>Dependent variables</i> | |
| Self-rated life satisfaction | Slightly satisfied or completely satisfied (74.1%), Completely dissatisfied, slightly dissatisfied or neither (25.9%) |
| Self-rated health | Good or very good (72.7%), Very poor, poor or neither (27.3%) |
| Self-rated economic inequality | Slightly large or very large (47.8%), Does not exist, not so large or average (52.2%) |
| <i>Independent variables</i> | |
| <i>Level 1</i> | |
| Age | 18-99, mean = 42 |
| Gender | Male (51%), Female (49%) |
| Education attainment | None (3.9%), Primary (1.8%), Secondary (44.6%), Tertiary (49.5%) |
| Personal monthly income (in 10,000 USD) | 0-2058, mean = 6.12 |
| SC score (individual level) | 1-5, mean = 4.04 |
| <i>Level 2</i> | |
| Average SC (country level) | 3.4-4.3, mean = 4.03 |
| Country groups | Low-income (53%), High-income (47%) |

mutual benefit” (Putnam,1993). SC was assessed by multiple items because a variety of definitions and measures of SC have been used in research. However, most scholars measure SC, including its cognitive and structural dimensions (Putnam, 2000; Murayama et al., 2012), using two broad approaches that conduct a census of groups and group memberships and use survey data on the level of trust and civic engagement (Fukuyama, 2001). Therefore, SC was assessed based on the two dimensions of trust and civic engagement in this study. Social trust was assessed by two items: “To be able to believe people/organizations is...”, with five response options ranging from “not at all important” to “very important”, and “Please tell us about safety of your neighborhood”, with five response options ranging from “very safe” to “very dangerous”. Civic engagement was assessed by asking four questions, regarding both formal and informal engagement. Formal engagement was assessed by asking “How attached are you to your local community?”, on a scale ranging from “completely detached” to “completely attached”, and “How often do you participate in community activities?”, on a scale ranging from 0 (“do not participate at all”) to 6 (“more than four days a week”). In addition, informal engagement was assessed by asking respondents to evaluate the items “Relationship with family that you feel is important in your life” and “Relationship with friends and acquaintances that you feel are important in your life”, with response options for both items including “important” and “not important”. To compute an SC score at the individual level, we calculated the individual arithmetic average of those factors. Moreover, we aggregated the SC score at the country level by taking the arithmetic average of the weighted individual responses. Although this is an imperfect proxy for SC, previous studies have supported the reliability of these factors (Knack and Keefer, 1997; Elgar et al., 2011; Murayama et al., 2012).

Independent variables comprised two levels: the individual level and the country level. Individual-level variables were age, gender, SC score, household income, and educational attainment. Yearly household income was collected as income ranges in local currency. We transformed the categorical ranges of income into real values by taking the midpoint of the corresponding range and dividing this midpoint by the purchasing power parity relative to USD to account for transnational differences in currency (Jebb et al., 2018). Average SC and country groups were independent variables at the country level. The country groups, which were divided according to low-income (lower-middle and upper-middle) and high-income, were determined using the World Bank data on the gross national income (GNI) per capita of countries in 2019-2020.

Analyses. Since the responses for self-reported life satisfaction and health, and perceived economic inequality were binary variables and due to the hierarchical structure of the data, we used multilevel logistical regression models based on a logit-link function. This technique can analyze the effects of individual characteristics (SC score) and country characteristics (average SC) on each dependent variable simultaneously (Jones and Duncan, 1995; Maas and Hox, 2004).

A simple multilevel logistic model is shown as follows:

$$Y_{ij} = \beta_0 + \beta_1 X_{1ij} + \beta_2 X_{2j} + u_{0j}$$

$$[u_{0j}] \sim N(0, \sigma_{u0}^2)$$

where Y_{ij} is the dependent variable and refers to binary responses of self-reported life satisfaction and health, and perceived economic inequality for individual i in country j . X_{1ij} represents individual-level variables (age, gender, SC score, household income, and education attainment), and X_{2j} represents country-level variables (average SC and country groups). The u_{0j} terms are the random differences, which represent country-level residual differences after taking into account both the individual-level and country-level differences. These are shown on the logit scale and are assumed to be normally distributed with a mean of 0 and variance of σ_{u0}^2 . To examine whether SC affected particular variables, we included interaction terms of average SC with the individual-level predictors of educational attainment and household income and the SC score with the country groups. We used MLwiN software for all analyses. All multilevel regressions were conducted using MLwiN version 2.36 software (Rasbash et al., 2016).

Results

We describe our results for SC, and self-reported life satisfaction and health, and perceived economic inequality as a proxy for subjective quality of life using multilevel regression of the survey results. Table 1 displays the descriptive statistics for the individual- and country-level study variables. Approximately 74.1% and 72.7% of the sample population reported high life satisfaction and good health, respectively, while 52.2% of the sample reported a small economic gap within society. However, the difference between small and large perceived economic gaps was small. This implies that compared to the other two variables, perceived economic inequality is very large in society.

Tables 2-4 present the results of the multilevel logit models for self-reported life satisfaction and health, and perceived economic

Table 2 Logit multilevel regression estimates for self-rated life satisfaction.

| Variable | Model 1 | Model 2 | Model 3 | Model 4 | Model 5A | Model 5B | Model 5C |
|---|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Fixed part</i> | | | | | | | |
| Constant | 1.09*** (0.08) | -5.26*** (0.16) | -7.91*** (3.35) | -6.63*** (2.42) | -6.81* (3.72) | -6.10** (4.32) | -6.37* (3.57) |
| Age | | 0.00 (0.00) | 0.00*** (0.00) | 0.00 (0.00) | -0.00** (0.00) | -0.00*** (0.00) | -0.00** (0.00) |
| Female (ref. Male) | | 0.08*** (0.02) | 0.09*** (0.02) | 0.07*** (0.02) | 0.07*** (0.02) | 0.07*** (0.02) | 0.07*** (0.02) |
| <i>Education attainment (ref. None)</i> | | | | | | | |
| Primary | | 0.01 (0.07) | -0.12 (0.07) | -0.10 (0.07) | -1.41*** (0.00) | -0.11* (0.07) | -0.12* (0.07) |
| Secondary | | -0.13*** (0.04) | -0.14*** (0.04) | -0.04 (0.04) | -0.28 (1.18) | -0.10*** (0.04) | -0.10*** (0.04) |
| Tertiary | | 0.02 (0.04) | 0.20*** (0.04) | 0.30*** (0.04) | 0.81*** (0.18) | 0.10*** (0.04) | 0.09*** (0.04) |
| Log | | 0.30*** (0.01) | 0.35*** (0.01) | 0.32*** (0.01) | 0.32*** (0.01) | 1.06*** (0.23) | 0.32*** (0.01) |
| <i>personal income</i> | | | | | | | |
| SC score | | 0.82*** (0.01) | 0.85*** (0.01) | 0.85*** (0.01) | 0.85*** (0.01) | 0.85*** (0.01) | 0.81*** (0.02) |
| Average SC | | | 0.13*** (0.07) | 0.28 (0.89) | 0.32** (0.13) | 2.12** (1.08) | 0.25*** (0.09) |
| Low-income country (ref. high-income) | | | | 0.32*** (0.10) | 0.32*** (0.11) | 0.33*** (0.09) | -0.22 (0.33) |
| <i>Interactions</i> | | | | | | | |
| Average | | | | | 0.22*** (0.19) | | |
| SC*Primary | | | | | 0.29*** (0.04) | | |
| Average | | | | | 0.38*** (0.09) | 0.18*** (0.06) | |
| SC*Secondary | | | | | | | |
| Average | | | | | | | |
| SC*Tertiary | | | | | | | |
| Average SC*Log | | | | | | | |
| <i>personal income</i> | | | | | | | |
| Low-income country * | | | | | | | |
| SC score | | | | | | | 0.08*** (0.02) |
| <i>Random part</i> | | | | | | | |
| Between countries | 0.24*** (0.06) | 0.90*** (0.20) | 0.88*** (0.20) | 0.92*** (0.21) | 0.93*** (0.21) | 0.97*** (0.22) | 0.93*** (0.21) |

***, ** and * denote statistical significance at the 1%, 5%, and 10%, respectively. Standard errors are in parentheses.

Table 3 Logit multilevel regression estimates for self-rated health status.

| Variable | Model 1 | Model 2 | Model 3 | Model 4 | Model 5A | Model 5B | Model 5C |
|---|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Fixed part</i> | | | | | | | |
| Constant | 1.05*** (0.10) | -3.48*** (0.15) | -5.11* (2.65) | -4.63* (2.75) | -2.88 (2.92) | -0.17 (5.30) | 8.28*** (3.53) |
| Age | | -0.02*** (0.00) | -0.02*** (0.00) | -0.02*** (0.00) | -0.02*** (0.00) | -0.02*** (0.00) | -0.02*** (0.00) |
| Female (ref. Male) | | -0.03*** (0.02) | -0.03*** (0.02) | -0.03*** (0.02) | -0.04*** (0.02) | -0.03*** (0.02) | -3.03*** (0.02) |
| <i>Education attainment (ref. None)</i> | | | | | | | |
| Primary | | -0.35*** (0.06) | -0.35*** (0.06) | -0.36*** (0.06) | 0.50*** (0.09) | -0.36*** (0.06) | -0.36*** (0.06) |
| Secondary | | 0.15*** (0.04) | 0.15*** (0.04) | 0.15*** (0.04) | -1.81 (1.14) | 0.16*** (0.04) | 0.15*** (0.04) |
| Tertiary | | 0.32*** (0.04) | 0.32*** (0.04) | 0.33*** (0.04) | -2.36*** (1.16) | 0.33*** (0.04) | 0.32*** (0.04) |
| Log personal income | | 0.23*** (0.01) | 0.23*** (0.01) | 0.23*** (0.01) | 0.23*** (0.01) | 0.23*** (0.01) | -1.06*** (0.23) |
| SC score | | 0.71*** (0.01) | 0.72*** (0.01) | 0.72*** (0.01) | 0.72*** (0.01) | 0.72*** (0.01) | 0.72*** (0.01) |
| Average SC | | | 0.65*** (0.40) | 0.69*** (0.22) | 0.73*** (0.20) | 0.70*** (0.10) | 2.97*** (0.88) |
| Low-income country (ref. High-income) | | | | 0.34*** (0.20) | 0.33* (0.19) | 1.08*** (0.27) | 0.35* (0.20) |
| <i>Interactions</i> | | | | | | | |
| Average SC*Primary | | | | | -2.56*** (0.46) | | |
| Average SC*Secondary | | | | | 0.48* (0.28) | | |
| Average SC*Tertiary | | | | | 0.66*** (0.28) | | |
| Average SC*Log personal income | | | | | | 0.32*** (0.06) | |
| Low-income country * SC score | | | | | | | |
| Random part | | | | | | | |
| Between Countries | 0.41*** (0.09) | 0.54*** (0.12) | 0.53*** (0.12) | 0.55*** (0.12) | 0.54*** (0.12) | 0.53*** (0.12) | 0.53*** (0.12) |
| | | | | | | | 0.37*** (0.02) |

***, ** and * denote statistical significance at 1%, 5%, and 10%, respectively. Standard errors are in parentheses.

inequality, respectively. The model strategy was the same for all three analyses. The models were increasingly more complex using the deviance information criterion (DIC) comparison. Models 1–4 were established from the null model, in which individuals are nested within countries with no predictor variables, extending to a model including individual-level and country-level variables.

The results of model 4 in Table 2 show that the SC score (individual-level) was associated with higher odds of reporting satisfaction with one’s life (ORs = 2.33). For other control variables, younger people, women, those with higher educational attainment and those with higher incomes, in general, reported higher life satisfaction than older people, men, those with lower educational attainment and those with low incomes.

Model 5 shows a further estimation of the cross-level interactions between each individual characteristic and the country-level variables. The interactions between average SC and educational attainment, average SC and income, and SC score and country groups are represented in models 5 A, 5B, and 5 C, respectively. To better understand each cross-level interaction on life satisfaction, Fig. 1(a) presents the results graphically. In terms of educational attainment, the odds of reporting life satisfaction for all the education groups increased with increasing SC at the country level. Individuals with a tertiary education level were more likely to report satisfaction than those with the other three levels of education, and there was a very large gap between the tertiary education level and the other three levels. Interestingly, the group with no formal education was likely to report that they were more satisfied with their life than the primary-level education group. Moreover, different income groups were represented by the lower quartile (LQ = 25%), the median quartile (MQ = 50%), and the higher quartile (HQ = 75%). Individuals in the higher quartile were more likely to report satisfaction than those in the other two income groups from countries with low SC, and the gap between them was wide, with increasing SC at the country level. In contrast, divergent trends were found for low-income and high-income country groups. Although there was a small difference between low-income and high-income countries’ individual reports of satisfaction at the individual level with low SC scores, the gap gradually widened with higher SC scores, and the increase was highlighted most for low-income countries.

In terms of self-reported health status in Table 3, the results of model 4 show that the SC score was associated with higher odds of reporting good health (ORs = 2.06) than average SC, while both were positively associated with reporting good health. The interactions between average SC and educational attainment, average SC and income, and the SC score and country groups are represented in models 5A, 5B, and 5C, respectively. Considering Fig. 1b, we identified a similar trend for health for different income groups as shown in Fig. 1a for life satisfaction. Moreover, educational attainment showed a similar trend for health, with increasing average SC except for primary level education. Interestingly, the country groups showed a divergent trend in good health when individuals’ SC scores increased. There was a small difference between individuals from low-income and high-income countries reporting good health at the individual level with a low SC score. The gap was wide with a higher SC score, and the increase was most marked for low-income countries.

Next, we discuss the results for the self-reported economic gap and SC. The interactions between SC and educational attainment, income, and country groups are shown in Table 4 (models 5A, 5B, and 5C). In contrast to the results shown in Fig. 1a and b, we did not observe a large difference between income groups with increased average SC, but individuals in all three income groups were likely to report a large economic gap in their local community in Fig. 1c. In terms of educational attainment, the

Table 4 Logit multilevel regression estimates for perceived economic gap.

| Variable | Model 1 | Model 2 | Model 3 | Model 4 | Model 5A | Model 5B | Model 5C |
|---|----------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| <i>Fixed part</i> | | | | | | | |
| Constant | -0.52***(0.09) | -0.64***(0.12) | -3.14(1.93) | -2.69***(0.92) | -1.98***(0.15) | 3.05***(0.79) | -3.16***(0.93) |
| Age | | -0.00****(0.00) | -0.00****(0.00) | -0.00****(0.00) | -0.00****(0.00) | -0.00****(0.00) | -0.00****(0.00) |
| Female | | -0.02*(0.01) | -0.02(0.01) | -0.02*(0.01) | -0.01(0.01) | -0.02*(0.01) | -0.02*(0.01) |
| (ref. Male) | | | | | | | |
| <i>Education attainment (ref. None)</i> | | | | | | | |
| Primary | | 0.09(0.06) | -0.09(0.06) | -0.09(0.06) | -0.09(0.01) | -0.08(0.06) | -0.08(0.06) |
| Secondary | | 0.01(0.04) | 0.01(0.04) | 0.01(0.04) | 0.16(1.05) | 0.01(0.04) | 0.17(1.05) |
| Tertiary | | 0.15****(0.04) | 0.16(0.04) | 0.16****(0.04) | -1.60(1.04) | 0.16****(0.04) | -0.17(1.05) |
| Log | | 0.02****(0.01) | 0.02****(0.01) | 0.02****(0.01) | 0.02****(0.01) | -0.55****(0.20) | 0.02****(0.01) |
| personal income | | | | | | | |
| SC score | | -0.03*(0.02) | -0.03*(0.02) | -0.03*(0.02) | -0.03*(0.02) | -0.10****(0.02) | -0.07****(0.01) |
| Average SC | | | -0.62****(0.04) | -0.48(0.48) | -0.54*(0.31) | -0.44(0.48) | -0.51*(0.28) |
| Low-income | | | | 0.21*(0.12) | 0.21*(0.12) | 0.21*(0.11) | 0.82****(0.19) |
| country (ref. high-income) | | | | | | | |
| <i>Interactions</i> | | | | | | | |
| Average | | | | | -0.26****(0.04) | | |
| SC*Primary | | | | | -0.45****(0.10) | | |
| Average | | | | | | 0.15****(0.05) | |
| SC*Secondary | | | | | | | |
| Average | | | | | | | |
| SC*Tertiary | | | | | | | |
| Average SC*Log | | | | | | | |
| personal income | | | | | | | |
| Low-income | | | | | | | |
| country * | | | | | | | |
| SC score | | | | | | | |
| Random part | | | | | | | |
| Between | 0.30****(0.07) | 0.29****(0.07) | 0.28****(0.06) | 0.26****(0.06) | 0.26****(0.06) | 0.27****(0.06) | 0.27****(0.06) |
| Countries | | | | | | | |

***, ** and* denote statistical significance at the 1%, 5%, and 10%, respectively. Standard errors are in parentheses.

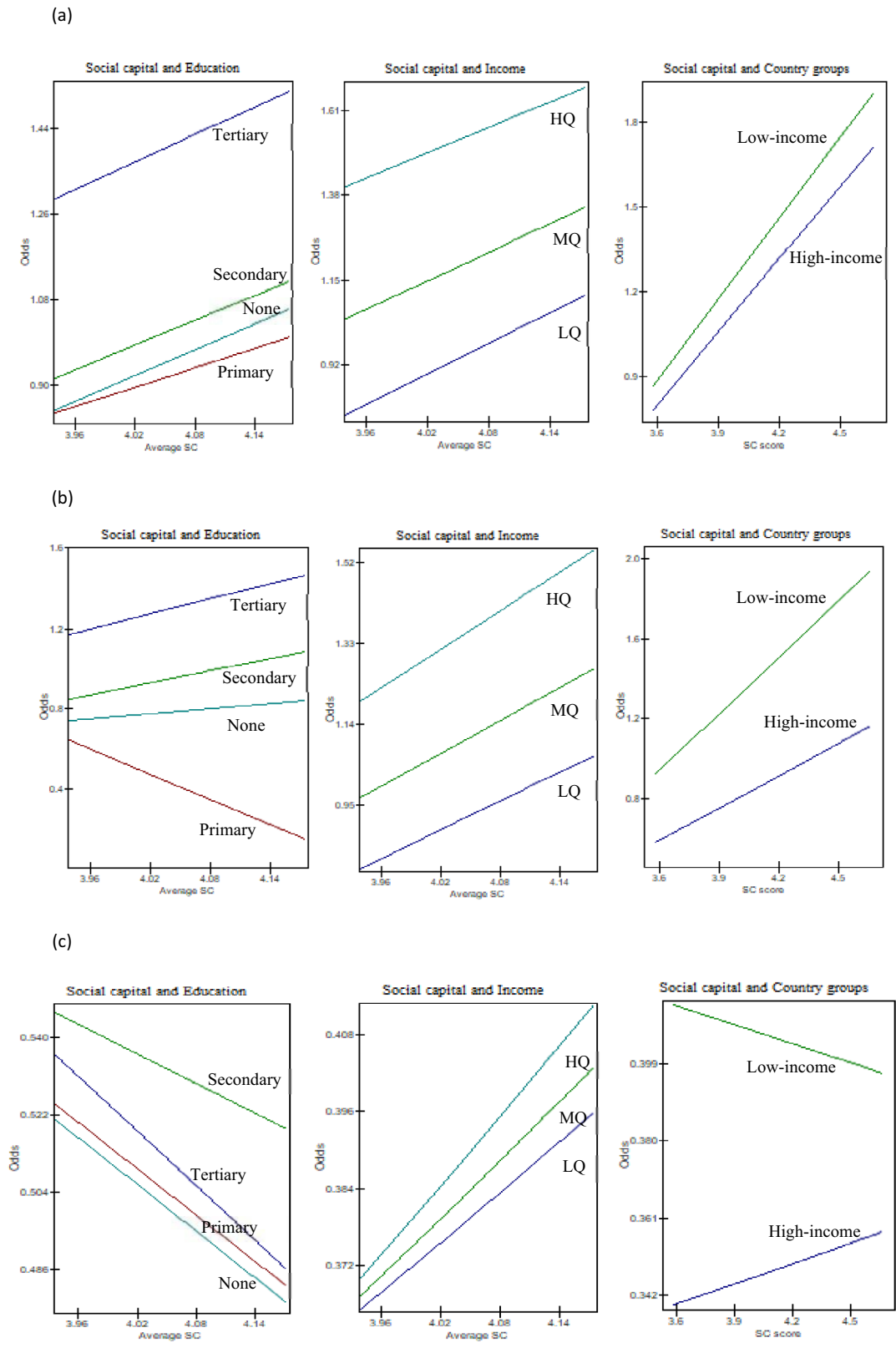


Fig. 1 Cross-level interactions with social capital. a-c Each plot is derived from Models 5A, 5B, and 5C of Tables 1-3. Odds of reporting education, income and country groups with SC are presented for life satisfaction (a), health (b) and economic gap (c). Average SC (country-level) and SC score (individual-level).

odds of reporting a large economic gap for all the education groups decreased with increasing SC at the country level. Individuals with a secondary level of education showed a higher negative trend than other levels of education with low and high

average SC. Furthermore, we observed an interesting result for country groups interacting with SC: low- and high-income countries showed a negative and positive relationship with increased individual SC, respectively. This means that when

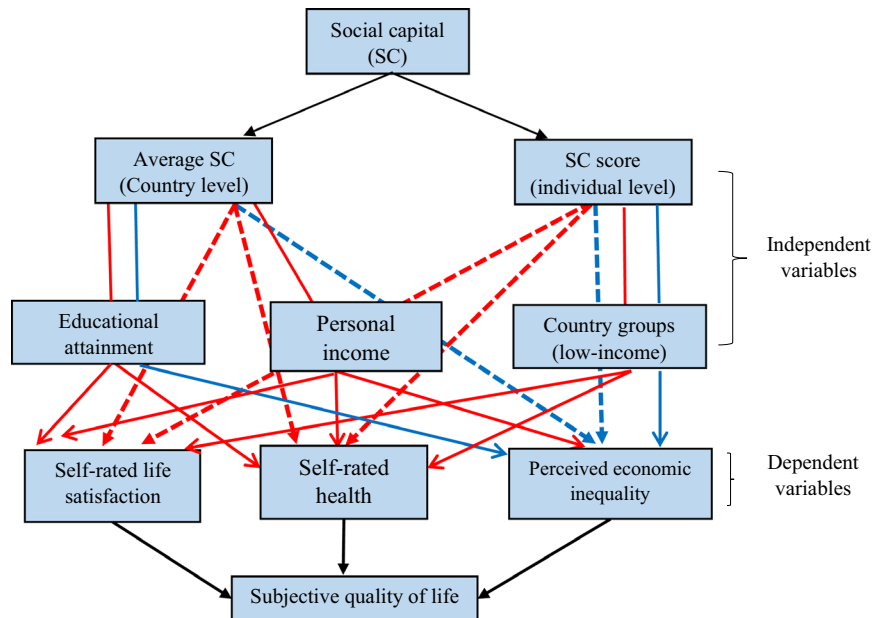


Fig. 2 Summary of the direct and indirect relationships of social capital with quality of life. The red and blue dotted arrows indicate direct positive and negative relationships, respectively. The red and blue line arrows indicate indirect positive and negative relationships, respectively.

individuals' SC increases, perceived economic inequality in the local community decreases in low-income countries and increases in high-income countries.

Discussion and conclusion

By using a multinational sample of 100,956 respondents, this study provides insight into subjective life experiences, with a link between self-reported SC and life satisfaction, health, and perceived economic inequality. We used multilevel logistic models to observe the effects of SC at the individual- and country-levels. Furthermore, we separated countries into low- and high-income groups, assuming that income level is correlated with a number of outcomes. A summary of the main results is presented in Fig. 2.

The results reveal that individual-level SC is positively associated with life satisfaction and health but negatively associated with perceived economic inequality within the local community. These results suggest that SC can play a role in better lives. The results are in line with research showing that trust, as a component of SC, is positively associated with health and life satisfaction (Elgar et al., 2011) and economic inequality (Hooghe et al., 2009; Paarlberg et al., 2018).

In terms of cross-level interactions on self-reported life satisfaction and health, and perceived economic inequality (Tables 2–4), there is a statistically significant interaction between education and SC whereby the impact of higher SC on decreasing perceptions of economic inequality increases with higher levels of education. This implies that higher educational attainment can enhance life satisfaction and health, while less economic inequality is associated with increased SC. This finding is also in line with research showing that educational attainment not only develops human capital but may also improve SC by passing along social rules and norms (Fukuyama, 2001). In contrast, educational attainment is not directly associated with less economic inequality (Solga, 2014).

Concerning the country groups, low-income countries show better outcomes for satisfaction, health, and economic inequality than high-income countries, in contrast to research suggesting that those outcomes would be more favorable in high-income countries (Kahneman and Deaton, 2010; Jebb et al., 2018). On the other hand, some low-income countries with limited resources

and facilities reported better subjective health and satisfaction with increased SC, indicating noneconomic factors that influence self-reported responses. Furthermore, this result suggests that developing SC can improve the quality of life, especially through health improvements in developing countries (Story, 2013). This is in line with findings from a sub-Saharan African study that found that SC can be used to improve health by identifying possible channels (Hollard and Sene, 2016). Concerning income groups, different levels of personal income are positively associated with considerable inequality in terms of good health and life satisfaction (Diener et al., 2010; Luhmann et al., 2011). Although income groups are positively related to economic inequality, the difference between groups decreases smaller as country-level SC increases.

Moreover, the results suggest that sociodemographic factors such as gender and age may be sources of difference in the way health, life satisfaction, and economic inequality affect the improvement of quality of life. Older people report life dissatisfaction and poorer health than younger people, in line with a study that found an inverse relationship between life satisfaction and age beyond 65 years (Chen, 2001). In contrast, aging and life satisfaction shows a positive relationship among the European elderly population (Gaymu and Springer, 2010), and life satisfaction has a U-shaped relationship with age profiles (Stone et al., 2010). In addition, our study finds that compared to men, women show higher life satisfaction and less perceived economic inequality but poorer health status. Men are more satisfied with their lifestyles than women are (Goldbeck et al., 2007). Our results are also in line with a few studies demonstrating that women are more satisfied with their lives than men (Knight et al., 2009; Jovanović and Lazić, 2020).

In conclusion, this study provides evidence that SC positively correlates with life satisfaction and health at the individual and country levels while negatively affecting the perceived economic gap within the local community. Regarding the interaction terms of country groups with individual SC, low-income countries have higher self-reported life satisfaction and good health than high-income countries with high SC. Moreover, low-income countries show a negative trend in perceived economic inequality when SC increases, whereas high-income countries show a positive relation.

This finding suggests that SC has the potential to improve the quality of life, especially in low-income countries. Therefore, we propose several suggestions that rely on our results to improve the quality of life in both country groups. First, high-income countries can learn from low-income countries about the important factors that improve their level of SC. Low-income countries have higher life satisfaction and better health than high-income countries with increased individual-level SC. Second, at the community level, social contact between income groups seems to have a strong link with reducing economic inequality between the rich and the poor, suggesting that organizing community participation opportunities may be beneficial. Additionally, higher country-level educational attainment is associated with a smaller economic gap, suggesting that educational institutes not only develop human capital but also improve SC by passing along social rules and norms. Finally, policy expertise is required for rational thinking about how SC stock increases in society because higher SC seems to have a strong link to quality of life at the community level.

This study has several limitations. One of the limitations is that while our models included controls for various social and demographic factors (education, age, gender, and income), there may be other factors that were unaccounted for that could have biased the results. Although our analysis also focused on both cognitive and structural dimensions (i.e., formal and informal trust and civic engagement) to measure SC, it is possible to ask a number of questions to cover many aspects of those two dimensions. Furthermore, this study only considered three domains as proxies for subjective quality of life (self-reported life satisfaction and health, and perceived economic inequality) in terms of data availability, but there are several domains within the concept of subjective quality of life. Single questions were used to assess these three domains based on existing studies, but multiple questions have the ability to cover more details in this regard. Although this study offers perspectives on the impact of SC on subjective quality of life, it cannot fully claim a causal impact due to the cross-sectional nature of the survey. Finally, these results could not determine country-level effects because the data were collected using a cross-sectional design and had low statistical power for detecting country-level effects ($N = 37$). Therefore, we controlled for differences in countries' income levels, as previous studies of low- and high-income countries have done (Diener et al. 2010), because there might be geographic, and cultural differences between countries that influence SC and its links to subjective quality of life.

Data availability

The data set used in this study is available from the corresponding author at a reasonable request. The data are not publicly available due to privacy or ethical restrictions.

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Competing interests

The authors declare no competing interests.

Ethical approval

The study design was approved by the appropriate legal and ethics review board of PEACEMIND Inc. The data were provided with informed consent from participants, according to legal and ethical guidelines. The data in this study do not target personal health information, and personal information is nonidentifiable. All the methods were performed in accordance with ethical guidelines and approved by the ethical committee of PEACEMIND Inc. For the original cross-sectional internet survey conducted by a third-party company (Nikkei Research Company) between July and August 2015, the study design was approved by the appropriate legal and ethics review board of Kyushu University.

Informed consent

At the beginning of each interview and web survey, respondents were informed about the purpose of the survey and their right to voluntarily participate. All participants provided informed consent prior to response to the questionnaire.

Additional information

Supplementary information The online version contains supplementary material available at <https://doi.org/10.1057/s41599-023-01502-7>.

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