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IQ and the wellbeing of nations

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Abstract: Given the increasing evidence between intelligence and socio-economic outcomes, investigating its effect on wellbeing is crucial. This paper aims to explore the influence of intelligence on individual life satisfaction using data from World Values Survey (WVS). We find evidence that higher-IQ nations are associated with higher levels of individual life satisfaction. In particular, the positive effect of intelligence is stronger in less developed nations. These findings suggest that investing in cognitive skills is socially advantageous.

Keywords: wellbeing; life satisfaction; intelligence; IQ; cross-country.

1. Introduction

In the past decade, empirical literature has witnessed the rise of studies that explore the effect of intelligence on wide range of national macroeconomic outcomes (e.g. Lynn and Vanhanen, 2012a). Indeed, these studies report that intelligence is associated with income, economic growth and GDP per capita - measures of development across nations (e.g. Lynn and Vanhanen, 2006; Salahodjaev, 2015a). Although, it is important to investigate the connection between intelligence and macroeconomic data, the usefulness of IQ-income association is limited

by 'distressingly large, measurable slippages between economic indicators and well-being' (Diener & Seligman, 2004, p. 1). For example, the methodological limitations of GDP do not consider the levels of poverty, ecological sustainability and health. Further, the association between GDP per capita and quality of life is not clear (Sen 1999; Stiglitz 2009; Diener et al., 2010) and empirical evidence is at best mixed (Easterlin, 2001). The acknowledgement of the disadvantages of economic data for measuring quality of life has shifted empirical literature 'toward measuring societal well-being using indicators that assess not only people's physical conditions, including their health, but also how people themselves evaluate their own well-being' (York and Bell, 2014 p. 48). Therefore understanding the association between intelligence and well-being enables researchers to pose a question of whether intelligence truly enhances people's lives, instead of conjecturing that it does deductively. That is the objective of this paper.

Several arguments are in favor of positive link between intelligence and well-being. First, intelligence is linked with efficient institutions. In particular, cross-country studies find that intelligence has a positive effect on governance measures (Kanayama, 2014), reduces market failures (Potrafke, 2012) and gender inequality (Salahodjaev & Azam, 2015). Market failures, measured by corruption indices, reduce standards of living and generate inefficiencies (Mauro, 1996) leading to lower levels of wellbeing (Sirgy et al., 2012). More recently, Salahodjaev (2015b) using data from 158 nations, over the period 1999–2007, finds that intelligence has robust negative effect on the size of shadow economy. On the household level, corruption reduces household wealth, which in turn has negative effect on wellbeing. We conjecture that intelligence is associated with higher levels of life satisfaction because intelligent societies establish efficient institutions and reinforce market policies.

Apart from institutional mechanisms, we suggest that there are social links by which intelligence may be connected with wellbeing. In this line, we conjecture that intelligence increases interpersonal trust and cooperation (Jones, 2008), which in turn contributes to wellbeing. For example, Sturgis et al. (2010), using data from two British cohort studies investigate a hypothesis that generalized trust among individuals differs consistently with the level of individual intelligence. The authors document that after controlling for a set of individual characteristics, intelligence calculated in childhood is a determinant of generalized trust in adulthood. Similarly, Carl & Billari (2014) explore the nationally representative sample of U.S. adults and report that intelligence retains its significant effect on generalized trust even

after controlling for socio-economic characteristics. Indeed, related literature finds that social capital is a robust predictor of life satisfaction (Helliwell, 2003; Helliwell, 2006). Departing from the finding, that intelligence maintains 'those relationships which provide people with a sense of trust and community' (Schneider, 1997 p. 30), we can expect that IQ captures collaboration within society in order to generate outcomes that have positive effect on wellbeing. In particular, intelligence increases the returns from social partnership because it promotes flow of information. Additionally, intelligence promotes political participation (Carl, 2014), and while educated agents have better control over national resources, a larger share of national income is directed to education and health (Burhan et al., 2015). In this vein, Salahodjaev (2015c) reports positive association between intelligence and financial development. For example, moving from country with the mean IQ score (84.1) to the highest national IQ score (107.1) is associated with 3.6 fold increase in the size of banking sector. Social networks without these kinds of resources lack the vital transparent communication, and interactions will require higher psychological costs.

Further evidence supporting the view that intelligence has positive impact on well-being can be deduced from understanding how intelligence influences behavioral tendencies. A substantial line of research documents statistically significant and negative link between intelligence and general crime rates (McDaniel, 2006; Pesta et al., 2010). Similarly, Bartels et al. (2010) reveals negative association between cognitive skills and nine different measures of crime: total violent crime rate, the homicide rate, the aggravated assault rate, the robbery rate, the total property crime rate, the burglary rate, the theft rate, and the motor vehicle theft rate. Other studies find that intelligence correlate negatively with antisocial behavior (Möttus et al., 2012), serious assault (Rushton & Templer, 2009), and positively with risk aversion (Frederick, 2005) and moral behavior (Oesterdiekhoff, 2014). Fear of crime inhibits behavior of individuals, and leads to greater dissatisfaction and strain (Moore and Trojanowicz, 1988). Combining social capital literature with the IQ-crime nexus, we argue that intelligent neighborhoods directly improve life satisfaction by offering individuals social protection when they encounter tense social circumstances, such as crime.

After all, a small strand of articles explores the link between intelligence (cognitive abilities) and subjective wellbeing utilizing country-level survey data. Chmiel et al. (2012), using data from the longitudinal MAGRIP project, concludes that “people with higher childhood

[general cognitive ability] (GCA) were more satisfied with many domains associated with socioeconomic success in life. Persons with a higher level of childhood GCA also experienced more [positive affect] and less [negative affect]" (p. 629). Similarly, Kanazawa & Li (2015), using National Longitudinal Study of Adolescent Health (Add Health), documents that intelligence has positive and statistically significant effect on life satisfaction.

However, intelligence may also reduce wellbeing. For example, intelligence increases consumption of alcohol (Batty et al., 2008; Johnson, et al., 2009), tobacco (Johnson et al., 2009) and drugs (Kanazawa & Hellberg, 2010). Countries with higher cognitive skills are associated with higher suicide rates (Lynn and Vanhanen, 2012a). Voracek (2004 p. 550) argues that 'population differences in intelligence may result in varying population proportions that rank beyond a threshold intelligence necessary for suicidal ideation, and this in turn could contribute to observed cross national differences in suicide incidence'. Intelligence is associated with lower levels of self-reported religiosity (Kanazawa, 2009), a behavior that has been positively linked with life satisfaction (Okulics-Kozaryn, 2010).

The aim of this study is to investigate the effect of national intelligence on subjective well-being, using cross-country data from the World Values Survey 1981–2014. We find that respondents in more intelligent countries report higher levels of life satisfaction. The results remain intact when we control for conventional determinants of life satisfaction: demographic characteristics, culture and social capital.

Our findings have important empirical and policy suggestions. First, we advance empirical literature on the causes of life satisfaction. While extant studies document that gender, income, employment, health have effect on subjective well-being, and we find that intelligence is another antecedent of life satisfaction that has yet not drawn substantial attention from happiness studies.

2. Data and Methodology

Data

We use WVS to explore the link between intelligence and life satisfaction. The WVS is a cross-national project studying changing values and their effect on social and political life. The WVS consists of nationally representative surveys administered in nearly 100 countries, which cover almost 90 percent of the world's population, using a universal questionnaire. Samples are drawn from the entire population of 18 years and older. After discarding missing observations our empirical estimation is based on more than 319,000 observations. This dataset has been successfully used in empirical literature to investigate the link between culture and economic development (e.g. Abdallah et al., 2008; Easterlin, 2009).

Dependent variable

In line with related literature, our main variable is self-reported level of life satisfaction. Life satisfaction is measured on a 10 point Likert scale ranging from 1 (completely dissatisfied) to 10 (completely satisfied) where respondents are asked: "All things considered, how satisfied are you with your life as a whole these days?". Figure 1 suggests that the distribution of answers is largely concentrated in the top of the range with a mean value of 6.8.

Independent variables

Intelligence is the variable of main interest in this study. As the measure of intelligence, we use national IQ data from Lynn and Vanhanen (2012b). Lynn and Vanhanen (2012b) is the updated dataset of cross-national IQ scored first published by Lynn and Vanhanen (2002). However due to absence of administered IQ tests IQ scores for a number of countries are estimated based on mean IQs for adjacent countries. Overall, after discarding the missing countries IQ scores range from 69.7 in Ghana to 107.1 in Singapore.

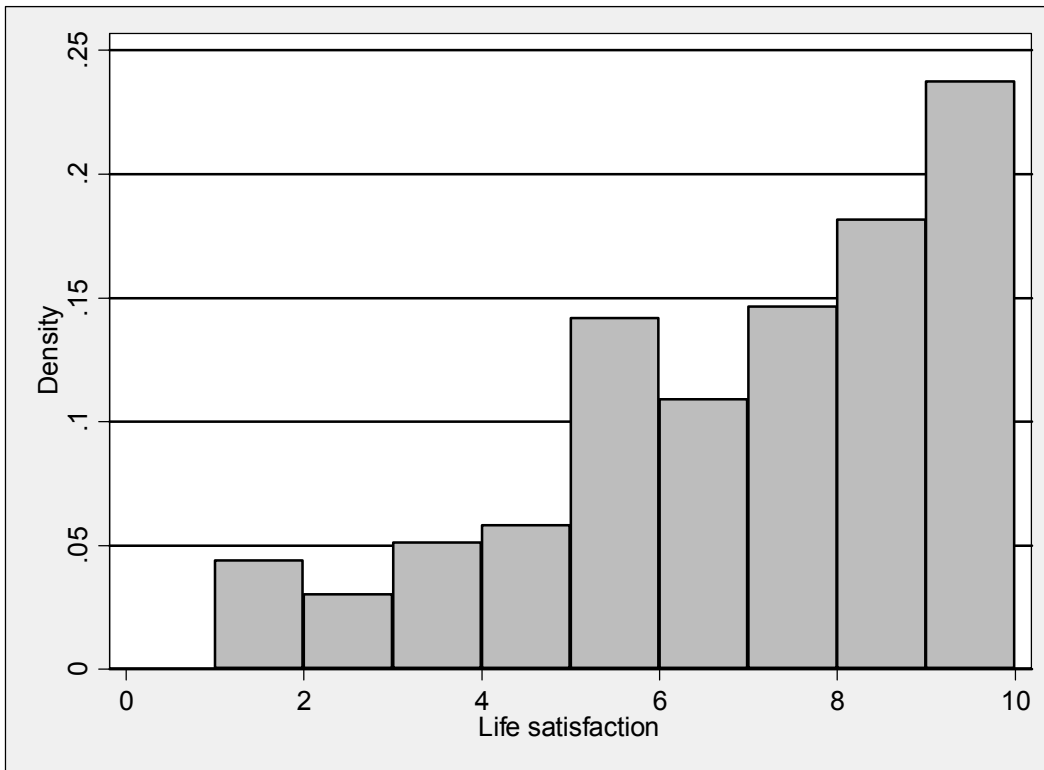


Figure 1. Distribution of life satisfaction

Source: WVS

The link between intelligence and life satisfaction at the macro level is presented in Figure 2, and exhibits positive association. Subjective wellbeing, however, likely highly connected with other variables, which need to be controlled for.

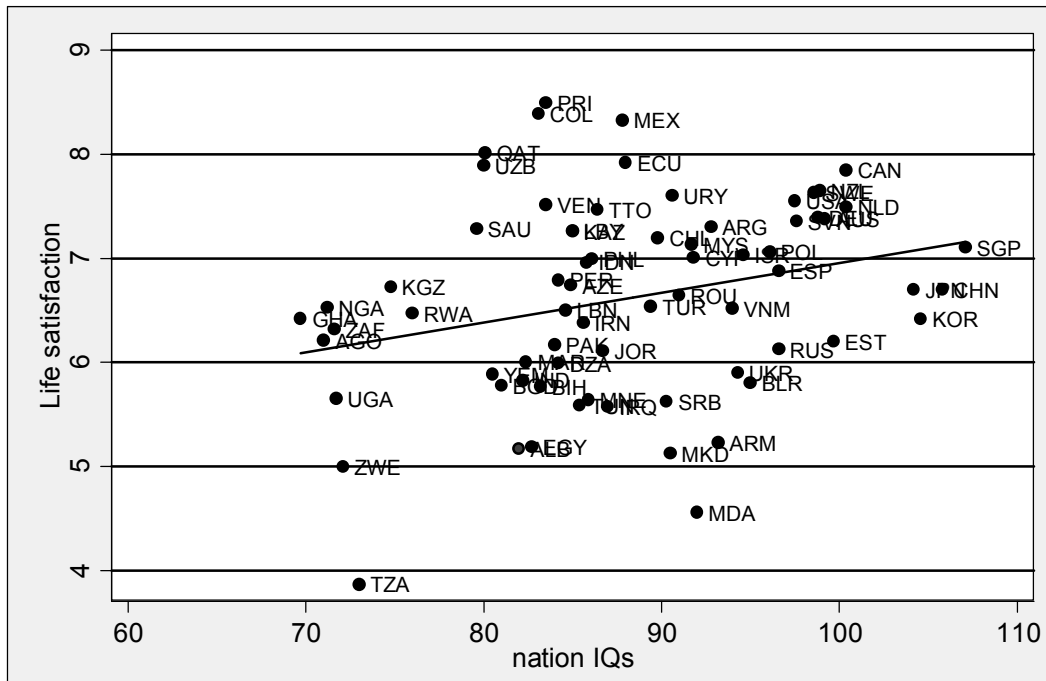


Figure 2. IQ scores and national life satisfaction

Sources: WVS, Lynn & Vanhanen (2012b)

Control variables

We also include socio-demographic factors that have been found important in related studies. Predominantly, related research is in conventional agreement that macroeconomic environment has effect on life satisfaction (Welsch, 2007). First, the review of an overall research indicates that respondents in more prosperous countries tend to declare higher levels of subjective well-being than individuals in poor countries, albeit the link is not robust (see e.g. Blanchflower & Oswald, 2011). We use GDP per capita as a measure of economic development. Second, ample cross-country and single-country studies document the negative effect of macroeconomic shocks (inflation and unemployment) on life satisfaction (Di Tella et al., 2001; Di Tella et al., 2003). For example, Deaton (2012), using Gallup Organization data, to investigate the subjective well-being of Americans since the collapse of Lehman Brothers. Author finds that around the time of high unemployment Americans stated lower life satisfaction than in the beginning of 2008.

In addition, happiness studies document that economic freedom and its dimensions may also have effect on life satisfaction (Veenhoven, 2000; Gropper et al., 2011; Nikolaev, 2014).

We use Index of economic freedom from Heritage foundation. The Index covers 10 freedoms – from property rights to entrepreneurship – in 186 countries.

Table 1 provides the description of the variables and Table 2 the summary statistics of the variables used in the regression analysis.

Model

In this study, we estimate the following conventional life satisfaction regression model:

$$LS_{i,n} = \alpha_0 + \alpha_1 IQ_n + \beta X + \varepsilon_{i,n}$$

where LS is self-reported life satisfaction of respondent i in country n; IQ is the national IQ scores; X is the vector of the control variables at the country level, and ε is a random error term.

We estimate our model using ordinary least squares (OLS) method. While there is consensus that OLS technique is the workhorse approach for fitting data, frequently the regression output is affected by inconstant variances of random error terms (heteroskedasticity). Heteroskedasticity may underestimate the standard residuals of regression, producing p-values that are too small (Hayes and Cai, 2007). Hence, in all regressions we report heteroskedasticity adjusted robust standard errors.

3. Results

The main regression results are reported in Table 3. Model 1 is the baseline regression where only IQ and logged GDP per capita are included as the right hand side variables. As suggested by the estimates, both intelligence and economic development are positively and significantly associated with life satisfaction. In particular, respondents living in one countries with intelligence one standard deviation above the mean are associated being approximately one fourth of a point higher on subjective well being. Furthermore, a one standard deviation increase in log GDP per person increases life satisfaction by 0.64 points (somewhat more than a half standard deviation).

In model 2, macroeconomics shocks included in the regression. In line with existing studies, both inflation and unemployment are negatively and significantly, at the 1% level, related to life satisfaction. For example, when unemployment increases by 10 percentage points

life satisfaction declines by 0.43 points. The results for IQ remain qualitatively consistent. Hence, intelligence once again seems to play an important role in cross-national differences in life satisfaction, after controlling for the macroeconomic environment.

Model 3 introduces additional control variable that is conjectured to be an antecedent of life satisfaction: economic freedom. This variable has the anticipated positive effect on life satisfaction, although it is statistically significant at the 10% level. In particular respondents in high income countries report being more satisfied by 0.6 points. Intelligence is significant at the 1% level. The results for IQ and other control variables are intact.

However, one may argue that the positive effect of intelligence on life satisfaction may be driven by presence of influential observations in our regression. Indeed, Huber (1973) and Yohai (1987) argue that estimates under the assumptions of OLS regressions are particularly responsive to the presence of influential observation and high leverage data points. To deal with this concern, we re-estimate equation (1) using robust regression. Robust regression performs a regression, calculates case weights from absolute residuals, and regresses again using those weights. The results in model 4 show that intelligence remains significant, at the 5% level.

Therefore, the findings in Table 2 suggest that intelligence, measured by national IQ score, is significantly linked with life satisfaction in the cross-country sample.

Table 3

Intelligence and life satisfaction: OLS results

	(1)	(2)	(3)	(4)
	OLS	OLS	OLS	RREG
IQ	0.022** (0.008)	0.019** (0.009)	0.020** (0.009)	0.019** (0.009)
Income	0.528*** (0.108)	0.533*** (0.106)	0.462*** (0.108)	0.448*** (0.103)
Inflation		-0.002*** (0.000)	-0.001*** (0.000)	-0.002** (0.001)
Unemployment		-0.043*** (0.012)	-0.039*** (0.012)	-0.040*** (0.015)

Freedom			0.015*	0.020**
			(0.009)	(0.009)
Constant	4.597***	5.306***	5.194***	5.246***
	(0.741)	(0.814)	(0.821)	(0.802)
<i>N</i>	92	92	91	91
adj. <i>R</i> ²	0.230	0.338	0.345	0.364

Notes: Robust standard errors in parentheses. * $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$. We use residualized log GDP per capita and economic freedom index.

5. Conclusion

A substantial line of studies have explored the determinants of life satisfaction. Earlier studies link life satisfaction with income (Easterlin, 1995), religion (Greene & Yoon, 2004), marital status (Di Tella et al., 2003), and social capital (Bjornikov, 2003). More recently, empirical literature finds novel causes of life satisfaction at individual level such as homeownership (Zumbro, 2014), internet (Penard et al., 2013), coastal proximity (Wheeler et al., 2012) and labor unions (Flavin et al., 2010). We extend this literature with the finding that intelligence is another determinant of life satisfaction. The positive effect of intelligence on life satisfaction is significant at the 1% level.

In particular we document that the effect of intelligence on life satisfaction remains significant after we control for per capita wealth. This has important policy implications for the countries that have not attained high income status as intelligence not only proxies human capital, but has effect on cooperation, corruption and financial development which in turn favor economic growth. Further, IQ may act a good estimate of the level of approval of market oriented reforms, because high-IQ individuals have longer time horizons (Jones & Podemska, 2010).

While the conclusions of earlier studies have been limited by the number of countries sampled, we employed data on more than 269,000 individuals in more than 100 nations. As for now, the findings in this study deserve attention as the promising avenue to explore the interplay between cognitive skills and life satisfaction.

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