RESEARCH PAPER

Does Inequality Shape Human Character? Cross-Cultural Associations between Character Strengths and the Gini Index in 68 Countries

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Abstract

Environmental factors are crucial in shaping individual characteristics. One key contextual factor is economic inequality, which is increasing in most OECD countries and negatively impacting individuals and societies, including personality traits. To date, no studies examined the relationship between economic inequality and positive personality traits such as character strengths. In a large cross-cultural study ($N=980,807$, 68 countries) we investigated the relationship between country-level economic inequality and the level of the 24 character strengths. Across countries, we found consistent, robust evidence that economic inequality is positively linked to 22 character strengths, even after controlling for the Human Development Index, population density, urbanization, and climate of each country. On average, inequality explained 34% of the between-country variance in character strengths. Different alternative explanations for such unexpected effects, including increased competitiveness or resilience in the face of adversity, are discussed. Our research provides novel insights into the importance of environmental factors in shaping human character.

Keywords Personality · Economic inequality · Cross-cultural study · Virtues · Geographical psychology · Socioecological psychology

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1 Introduction

Most of the psychological research on personality focused its attention on the processes happening within the individual without deeply considering the influence of physical, climatic, political, economic, or cultural conditions to which the individual is mostly exposed (Oishi, 2014; Park & Peterson, 2010; Rentfrow, 2020). Two recent approaches that try to fill this gap are socioecological and geographical psychology, which aim to understand how individuals and social ecologies define each other (Oishi, 2014; Rentfrow, 2020). One of their hypotheses is that characteristics of the cultural or natural environment (e.g., economic conditions, inequality, hot climate) may favor particular psychological states and consequently give rise to the establishment and maintenance of a specific form of social ecology (i.e., a natural and social habitat) that will characterize the inhabitants of a specific place, city, or country. In these kinds of association studies, the goal is to illuminate the relationship between social ecology and a certain cognition, behavior, or emotion (Oishi, 2014; Rentfrow, 2020).

One environmental factor that may shape people's thoughts, behaviors, and feelings is economic inequality, broadly defined as the unequal distribution of income and economic means between different groups in society. Economic inequality is here relevant since it is increasing globally (Coffey et al., 2020) and has recently reached its peak since 1950 (Chancel et al., 2021). The impact of economic inequality on well-being has been largely studied at both correlational (Wilkinson & Pickett, 2017) and experimental (Oishi et al., 2011; Roth et al., 2017) levels, and research consistently demonstrated a link between economic inequality and decreased individual (Vogli et al., 2014; Wilkinson & Pickett, 2017) and societal (Sánchez-Rodríguez et al., 2019b; Wilkinson & Pickett, 2017) well-being. Despite this, there are some relevant differences between the effects of economic inequality on individuals and societies, with literature concerning individual-level self-reported well-being being mixed, and providing evidence of negative, positive, or null effects (Kelley & Evans, 2017; Ngamaba et al., 2018; Sommet & Elliot, 2022), while literature concerning societal outcomes (e.g. competition, lack of social cohesion), being more stable on the positive pole (Jetten et al., 2021; Peters & Jetten, 2023).

While the literature exploring the link between economic inequality and well-being is extensive, less attention has been paid to the relationship between economic inequality and individual personality traits. Findings show that economic inequality predicts cross-cultural differences in biased self-perception of 80 personality traits and values (also known as self-enhancement, or to see oneself as better than the average person) over individualism/collectivism dimensions (Loughnan et al., 2011). In other words, the more unequal a country is, the more individuals tend to perceive themselves as superiors to others, competing more (for scarce resources) and being less willing to engage in prosocial behaviors (Kirkland et al., 2021). This may result in a decrease in social cohesion (Wilkinson & Pickett, 2017). Congruently, de Vries and collaborators (2011) found that across U.S. states, income inequality was associated with lower agreeableness, even after accounting for socioeconomic factors such as sex, education, urbanization, or income. The authors suggest that economic inequality leads individuals to become more self-focused, less friendly, and less altruistic by eroding social cohesion and accentuating social hierarchy. This is also in line with a recent theoretical framework proposed by Sánchez-Rodríguez et al. (2023, the EINIM, Economic Inequality as Normative Information Model), which conceives inequal-

ity as a cue that people use to infer the normative climate of a given society, which, in turn, regulates people emotions and behaviors. Specifically, in more unequal countries people perceive that the normative climate is individualistic and competitive (Sánchez-Rodríguez et al., 2019) prompting the distinctions between socio-economic classes (Kraus et al., 2017) and heightening people's desire for wealth and status while decreasing the sense of a shared identity (Jetten et al., 2021; Tanjitpiyanond et al., 2022). Moreover, the enhanced distinctions between socio-economic classes prompted by inequality (Kraus et al., 2017), increase social comparison and that may push people to compete for social superiority and be more likely to engage in self-enhancement strategies to gain an advantage over others (Melita et al., 2021; Sánchez-Rodríguez et al., 2019b).

However, personality is not easily malleable and may not be the best psychological characteristic to be studied in this case. On the contrary, character strengths are 24 positive personality traits (see Table 1 for an overview) that may be more easily affected by cultural and environmental features to which individuals are exposed throughout their lives, as they are malleable, morally valued, and socially desirable (Park & Peterson, 2010; Peterson & Seligman, 2004). More precisely, research suggests that character strengths can be considered a subset of personality traits that specifically concern "goodness" and moral behavior (McGrath et al., 2020). Indeed, they are morally valued per se, even in the absence of tangible positive outcomes (Stahlmann & Ruch, 2020); therefore, they are culturally and socially encouraged, and possibly shaped by specific factors, such as economic inequality, that precisely influence moral behavior and prosociality (Kirkland et al., 2021; Wilkinson & Pickett, 2017). Importantly, the VIA framework arose from an extensive philosophical and historical investigations of what constitutes a "good character" throughout different times and cultures around the world. In other words, character strengths were identified as

Table 1 Character strengths classification. Adapted from Peterson and Seligman (2004, pp. 29–30)

Core Virtues	Corresponding Character Strengths
Wisdom: Acquire and use knowledge	Creativity [Originality, ingenuity] Curiosity [Interest, novelty seeking, openness to experience] Judgment [Open-mindedness, critical thinking] Love of learning [Systematically adding knowledge] Perspective [Wisdom]
Courage: Pursue goals despite adversity	Bravery [Valor, assertiveness] Perseverance [Persistence, industriousness] Honesty [Authenticity, integrity] Zest [Vitality, enthusiasm, vigor, energy]
Humanity: Care for other people	Love [Closeness, intimacy] Kindness [Generosity, nurturance, care, compassion] Social intelligence [Emotional intelligence]
Justice: Care for the community	Teamwork [Citizenship, social responsibility, loyalty] Fairness [Equity, impartiality] Leadership [Guidance, supervision]
Temperance: Resist excess	Forgiveness [Mercy] Humility [Modesty] Prudence [Cautiousness] Self-regulation [Self-control]
Transcendence: Connect with purpose	Appreciation of beauty and excellence [Awe, wonder] Gratitude [Thankfulness] Hope [Optimism, future-mindedness, future orientation] Humor [Playfulness] Spirituality [Religiousness, faith, purpose]

positively valued moral qualities across different countries, and – as showed by McGrath study on VIA measurement invariance (2015) – the VIA assessment is transculturally valid and "there is remarkable consistency in the self-description of character strengths across nations" (McGrath, 2015, p. 51). Character strengths are therefore particularly apt to study cross-cultural phenomena.

To our knowledge, only one study (Park & Peterson, 2010) investigated in depth the geographical variation of character strengths, although only at the city level and not considering inequality. The authors drew a distinction between strengths of the "head" (intellectual and self-directed strengths such as curiosity and creativity) and strengths of the "heart" (emotional and other-directed strengths such as gratitude and love) and found that strengths of the head were more endorsed in more innovative (e.g., more colleges, universities, and technological factories) and liberal U.S. cities, while strengths of the heart were more common in less innovative and more conservative ones. More specifically, "head" cities were characterized by a focus on individual achievement, affluence, education, and change, while "heart" cities were more directed on valuing the emotional bonds among people as what makes life meaningful. In line with these results, economic inequality could be positively related to self-focused strengths, while negatively associated with other-directed strengths, as indirectly suggested by the studies linking economic inequality to the perception of an individualistic and competitive normative climate (Sánchez-Rodríguez et al., 2019; Sánchez-Rodríguez et al., 2019a, b).

Furthermore, Niemiec (2020) suggested that character strengths help individuals thrive under adversity, making them less prone to negative effects, more able to reinterpret adversity in a positive way, and recover from it. In this sense, under conditions of high economic inequality, individuals may resiliently develop their individual character strengths to face the highly competitive environment, similarly to what happened after traumatic events during which character strengths increased and/or predicted better adjustment (Casali et al., 2022; Gander & Wagner, 2022; Peterson et al., 2008). Alternatively, and similarly to the case of agreeableness (de Vries et al., 2011) economic inequality could undermine character strengths, by creating an individualistic, competitive environment (Sánchez-Rodríguez et al., 2023) where people learn to disregard morally-relevant qualities that also contribute to societal well-being.

1.1 Rationale and Hypotheses

Character strengths are malleable and morally valuable, and, more than personality traits (e.g., the big five), might be great candidates to study the effects of inequality on individuals' characteristics. Interestingly, different competing hypotheses may arise from the literature to answer this question, which has never been directly investigated.

To this aim, we tested the association between character strengths levels and economic inequality across 68 different countries from all over the globe. We also controlled for other possible intervening factors, such as Gross National Income per capita (GNI), national education, and life expectancy, as summarized by the Human Development Index (HDI) of each country (Cifuentes et al., 2008), population density, urbanization, and climate (average temperature). In terms of countries considered, this is the largest analysis on the topic (i.e., personality traits included) at the time of writing.

Building on the assumption of geographical and ecological psychology (Rentfrow, 2020), on the evidence that personality and character regional differences exist (Götz et al., 2020; Park & Peterson, 2010), on literature suggesting that economic inequality triggers the perception of a competitive normative climate (Sánchez-Rodríguez et al., 2023), and on the few studies on the personality-economic inequality link (de Vries et al., 2011), we formulated three sets of concurrent hypotheses:

Hypothesis 1 Economic inequality is positively related to character strengths. Economic inequality may be regarded as an adverse and competitive environment that calls for individuals to present as better than others and use their best qualities to a higher extent in order to thrive, in line with past literature (Loughnan et al., 2011; Niemiec, 2020; Wilkinson & Pickett, 2017).

Hypothesis 2 Economic inequality is negatively related to character strengths. The competitive and individualistic environment that is typical of countries with higher inequality, drives people to be less friendly, agreeable, and to be more selfish and less prosocial. For these reasons, and in line with results associating economic inequality with lower agreeableness (de Vries et al., 2011) and with the EINIM theoretical framework (Sánchez-Rodríguez et al., 2023), character strengths might be negatively associated with inequalities.

Hypothesis 3 Economic inequality is related positively to some character strengths, and negatively to others. More specifically, it may be hypothesized that higher economic inequality is positively associated with more self-focused strengths (such as creativity or curiosity) and negatively associated with other-focused strengths (such as gratitude or love) (Peterson & Park, 2010, de Vries et al., 2011).

2 Materials and Methods

2.1 Measures and Procedure

2.1.1 Character Strengths

Character strengths' values were obtained from McGrath's study (2015). The mean level of 75 countries, its standard deviation, and the associated number of respondents was reported (or kindly provided by the author) for each of the 24 character strengths measured with the Values in Action Inventory of Strengths (VIA-IS-240). This data summarizes 1,063,921 responses freely given by adults visiting the Authentic Happiness (www.authentichappiness.com) or VIA Institute (www.viacharacter.org) websites and completing the VIA-IS-240 questionnaire between 2002 and 2012. The VIA-IS-240 is a 240-item questionnaire measuring the 24 character strengths (10 item each) with a five-point Likert scale from very much unlike me to very much like me. The VIA-IS scales are associated with Cronbach's alpha values of 0.70 or higher (Peterson & Seligman, 2004). The VIA assessment is a valuable measure of character strengths that was validated across different countries and continents (Feraco et al., 2022; McGrath, 2015).

Despite the dataset is large, it might not be representative of the entire population of each country. Indeed, as McGrath noted (2015), respondents have a high degree of education and they must also be aware of virtues and character to find the compilation sites. While these limitations should be considered when interpreting our results, education, age, and gender differences are negligible between countries, suggesting that the samples are comparable, even if not representative of the entire population.

2.1.2 Economic Inequality

As an index of national inequality, the Gini coefficient of the 75 nations included in McGrath's study (2015) was retrieved from the World Bank on the 4th of January 2022 when available (https://data.worldbank.org/indicator/SI.POV.GINI). In line with the character strengths data, we considered Gini coefficients referring to the 2002–2012 years. The mean value for each country was calculated considering only the years in which the index was available. Data were available only for 68 of the 75 countries considered (i.e., the Gini index was not available for United Arab Emirates, Bahamas, New Zealand, North Korea, Qatar, Saudi Arabia, and Singapore). Lower Gini coefficients indicate lower inequalities.

2.1.3 Country Development

The Human Development Index (HDI) was used as a summary measure of the development of a country in three main different dimensions: Long and healthy life, as measured by the life expectancy index calculated by life expectancy at birth; knowledge, as measured by the education index calculated using expected years of schooling at birth and mean years of schooling of adults aged 25 or more; and decent standards of living, as measured by the Gross National Income per capita (GNI), calculated using the logarithm of income to account for the diminishing importance of income with increasing GNI. The HDI values from 2002 to 2012 for each of the 68 nations whose Gini index was available and character strengths measured were collected and their mean calculated. Data were retrieved from the United Nations Development Program website (https://hdr.undp.org/en/data) on the 10th of April 2022. Higher HDI values indicate more developed countries.

2.1.4 Urbanization, Climate, and Population Density

Other control variables were included in the models as covariates to ensure that the association between character strengths and economic inequality is not explained by other contextual factors. Although the number of control variables that could be included is large, we decided to focus on countries' level of urbanization (i.e., percentage of the population living in urban areas), population density (inhabitant per squared kilometer), and climate (i.e., average temperature). Indeed, climate and temperature and population density are expected to influence human behavior and personality within and across countries (Ebert et al., 2022; Gelade, 2013; Rinderu et al., 2018; Webster & Ward, 2011; Wei et al., 2017). Urbanization indices, on the other side, were directly linked to character strengths in the only study about regional variation of character strengths (Park & Peterson, 2010) and to agreeableness in the only other studied reporting an association between personality traits and income inequality (de Vries et al., 2011). For this reason, we decided to control for urbanization also at the

cross-national level. All the data were retrieved from the World Bank repositories (https:// data.worldbank.org). The average score between 2002 and 2012 for each country was calculated for each indicator.

No power analysis was conducted for this study because a large dataset of archive data was analyzed. A leave-one-out procedure will be adopted to ensure that the results are robust.

This study was not preregistered.

2.2 Statistical Analysis

Given that we had no access to individuals' data but only to the aggregated country scores, a meta-analytical approach to the analysis was adopted to account for the uncertainty related to the estimates of character strengths' scores in countries with varying number of respondents. This is almost equivalent to the use of multilevel regressions with participants nested in countries (DeBruine & Barr, 2021). Bivariate correlations between countries' strengths values and countries indicators are also reported (see Table 2).

Table 2 Correlations of the 24 character strengths with the gini and other country indices and indices of variability in between-country scores of character strengths

	Gini	HDI	Population Density	Urbanization	Temperature	Range	tau	i2
Appreciation of beauty	0.55*	−0.61*	−0.14	−0.45*	0.45*	0.81	0.14	99.71
Bravery	0.62*	−0.53*	−0.26	−0.33	0.56*	0.76	0.15	99.79
Creativity	0.67*	−0.58*	−0.23	−0.35	0.60*	0.58	0.13	99.66
Curiosity	0.36	−0.08	−0.30	−0.02	0.21	0.61	0.11	99.65
Fairness	0.60*	−0.50*	−0.24	−0.33	0.57*	0.64	0.15	99.85
Forgiveness	0.60*	−0.56*	−0.30	−0.43*	0.56*	0.72	0.12	99.66
Gratitude	0.69*	−0.63*	−0.17	−0.42*	0.67*	0.88	0.19	99.88
Honesty	0.64*	−0.52*	−0.15	−0.36	0.60*	0.70	0.14	99.85
Hope	0.68*	−0.62*	−0.19	−0.42*	0.61*	0.93	0.20	99.87
Humility	0.60*	−0.63*	−0.03	−0.5*	0.72*	0.81	0.17	99.84
Humor	0.49*	−0.37	−0.39*	−0.24	0.4*	0.66	0.11	99.55
Kindness	0.51*	−0.56*	−0.20	−0.44*	0.54*	0.68	0.15	99.85
Leadership	0.63*	−0.56*	−0.24	−0.41*	0.63*	0.78	0.17	99.87
Love	0.56*	−0.45*	−0.19	−0.28	0.46*	0.57	0.13	99.73
Love of learning	0.25	−0.07	−0.23	0.02	0.05	0.61	0.11	99.56
Judgment	0.63*	−0.46*	−0.29	−0.28	0.54*	0.55	0.11	99.72
Perspective	0.59*	−0.40*	−0.14	−0.22	0.56*	0.57	0.12	99.74
Perseverance	0.65*	−0.52*	−0.16	−0.34	0.61*	0.91	0.18	99.82
Prudence	0.68*	−0.56*	−0.09	−0.36	0.64*	0.82	0.17	99.85
Self-regulation	0.61*	−0.47*	−0.04	−0.33	0.62*	0.73	0.14	99.77
Social intelligence	0.57*	−0.39*	−0.19	−0.23	0.49*	0.69	0.13	99.77
Spirituality	0.67*	−0.71*	−0.06	−0.53*	0.72*	1.32	0.35	99.93
Teamwork	0.62*	−0.53*	−0.21	−0.38	0.63*	0.91	0.18	99.89
Zest	0.60*	−0.45*	−0.23	−0.30	0.58*	0.88	0.15	99.78

Note. * = p<.001

To ensure that character strengths show variability between countries, we fitted a meta-analytical model that estimates the average countries' scores of each character strength and extracted tau (τ, or the variance of the estimates), I^2 (the ratio between the true between countries variance and sampling variance), and whether the meta-analytical Q test of heterogeneity is significant, which indicates that there is a consistent amount of heterogeneity in the data. We also inspected the ranges of the character strengths scores and the median standard deviation of character strengths scores.

Two sets of meta-regressions were run with the meta-analytical value of each character strength as dependent variable and, respectively, the mean Gini index (first set of meta-regressions) and the mean Gini index plus HDI, population density, urbanization, and average temperature (second set of meta-regressions) of the 68 countries as moderators. In the second set of analysis, additional indicators were added as covariates to control whether the effect of the Gini index remained stable when other estimates of development, income, urbanization, and climate were added. Given that the measures adopt different scales and that changes on a Likert scale could be meaningless and difficult to interpret or compare between different scales, we also calculated the meta-analytical pseudo R^2 to obtain a meaningful effect size for the ability of the moderators to explain the mean level of the 24 character strengths. This is expected to be accurate when the number of observations exceeds 40 (López-López et al., 2014). Confidence intervals for the R^2 were calculated via bootstrap.

Finally, to ensure that the results were stable and not related to specific countries, a leave-one-out approach was adopted, and the analyses were run again removing one country at the time.

3 Results

All analyses were run using the R (R Core Team, 2022) package metafor (Viechtbauer, 2010). Bivariate Pearsons' correlations between character strengths at the national level and the other national indices are reported in Table 2. Descriptively, the world maps with their associated level of character strengths are represented in Figure S1 in supplementary materials.

Table 2 also provides results about the between-countries variability of strengths scores. These show that the Q test for heterogeneity is always significant ($p<.001$), that most of the variance can be considered true variance ($I^2>0.99\%$), and that τ varies between 0.11 and 0.35. Also, the ranges are quite large and vary between 0.55 and 1.32, which is always more than the median within-country standard deviation in each country's scores.

3.1 Associations between Economic Inequality and Character Strengths

The first set of meta-regressions, each having one of the 24 character strengths as dependent variable and the country's Gini coefficient as predictor, shows that the Gini coefficients consistently relate to the mean level of the specific character strengths of the country (see Table 3; Fig. 1 for the complete results). A significant positive association emerged for 23 out of 24 character strengths (i.e., all except love of learning) indicating that inhabitants of less equal countries (higher Gini coefficients) report higher levels of character strengths. Confidence intervals did not include zero in any case except curiosity and love of learn-

Table 3 Results of the metaregressions with gini index as predictor of character strengths. All the effects are Significant for $p<.001$ except Curiosity ($p<.01$) and Love of learning ($p>.05$)

Strength	Beta	95% CI	R2	95% CI
Appreciation of beauty	0.90	[0.57;1.24]	29	[6.63;48.73]
Bravery	1.04	[0.71;1.36]	37	[20.08;53.14]
Creativity	1.01	[0.73;1.29]	44	[25.59;60.71]
Curiosity	0.43	[0.15;0.72]	11	[-6.75;25.26]
Fairness	1.00	[0.67;1.33]	35	[15.54;52.67]
Forgiveness	0.86	[0.58;1.14]	36	[17.88;51.68]
Gratitude	1.55	[1.16;1.94]	48	[31.91;63.89]
Honesty	1.02	[0.72;1.32]	40	[24.49;55.44]
Hope	1.59	[1.18;2.01]	46	[29.99;61.84]
Humility	1.21	[0.82;1.59]	36	[17.45;53.79]
Humor	0.59	[0.32;0.86]	21	[0.48;39.50]
Kindness	0.91	[0.53;1.28]	25	[5.99;41.58]
Leadership	1.22	[0.86;1.58]	40	[23.26;55.42]
Love	0.81	[0.52;1.11]	31	[10.33;49.55]
Love of learning	0.30	[0;0.60]	4	[-8.72;12.68]
Judgment	0.80	[0.56;1.05]	39	[20.08;55.54]
Perspective	0.80	[0.53;1.08]	34	[13.18;51.83]
Perseverance	1.33	[0.96;1.71]	43	[28.28;56.87]
Prudence	1.31	[0.98;1.65]	47	[30.69;62.91]
Self-regulation	1.01	[0.69;1.32]	38	[22.02;52.63]
Social intelligence	0.84	[0.54;1.14]	31	[14.28;47.31]
Spirituality	2.69	[1.96;3.41]	44	[26.92;60.84]
Teamwork	1.32	[0.91;1.72]	38	[19.09;55.03]
Zest	1.06	[0.71;1.40]	35	[18.63;50.77]

Note. CI=Confidence intervals; Confidence intervals for R^2 are calculated via bootstrap

ing. Inequality explained between 21% (humor) and 44% (spirituality) of the variance in between-countries levels of character strengths, with a mean of 34.67% (SD=10.73%) of variance explained, including curiosity and love of learning in the calculation.

To ensure that the results are stable independently from the countries considered, we ran a leave-one-out analysis and repeated each meta-regression 68 times removing one country at each time. Results show that the R^2s remain quite stable with some exceptions (e.g., Nepal) that tended to strengthen even more our results: The R^2 always increased in these cases. Complete results are reported in supplementary materials (Table S1) and are represented in Fig. 2.

Given that country inequality, as measured by the Gini index or other indicators of economic inequality, is also related to other aspects of the country such as the gross domestic product or inhabitants' education or population density (Pickett & Wilkinson, 2010), we further inspected the association between inequality and character strengths when controlling for such aspects. To this aim we adopted the human development index (HDI), which includes estimates of life expectancy, education, and gross national income per capita, population density, urbanization, and the average country's temperature. Before running the analysis, urbanization was linearly transformed to include values between 0 and 1. Similarly, temperature and population density were divided by their maximum value. This was done to obtain non-zero beta values given the different scales used (i.e., mean scores varies in the order of hundredths, population density varies in the order of hundreds), but it does not change the results.
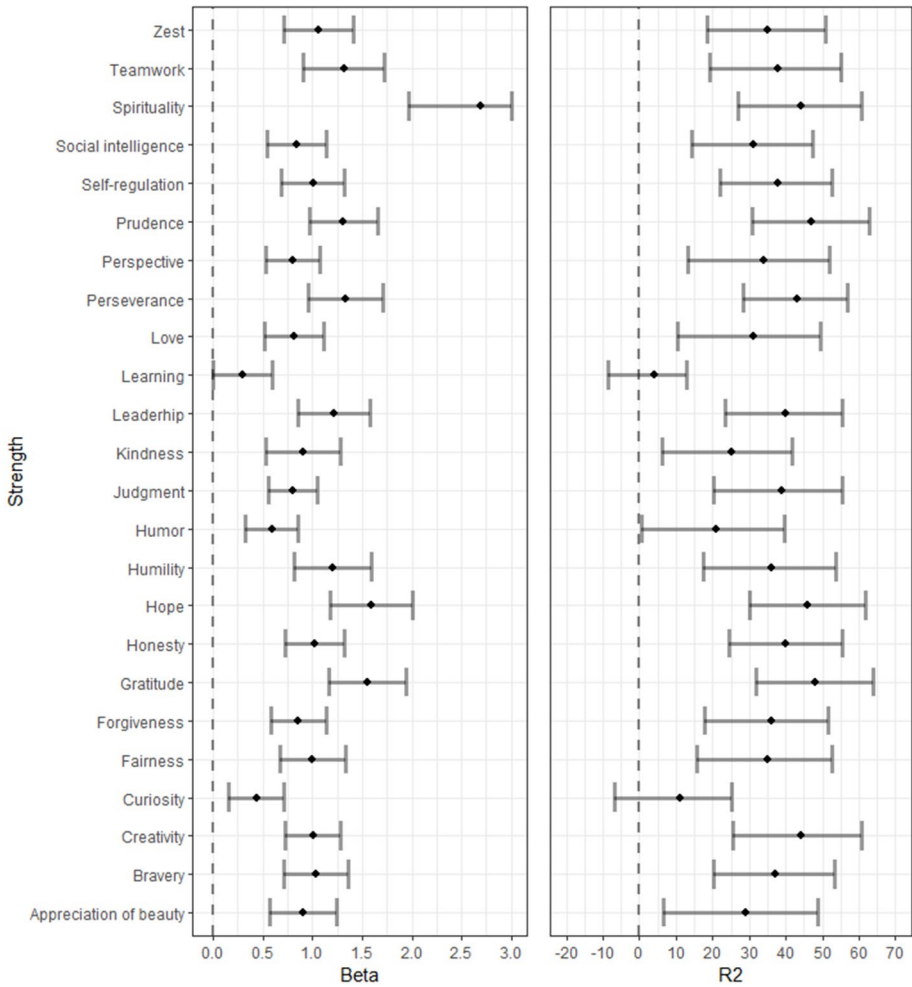
Fig. 1 Results of the metaregressions with gini index as moderator. Beta values are on the left panel and R2 values on the right panel. Bars indicate 95% confidence intervals. *Note.* Spirituality's upper bound of the confidence interval has been truncated

As plausible, when adding moderators into the meta-regression, the magnitude of the association between character strengths and Gini index slightly decreased, but still resulted statistically significant ($p<.05$) for 20 character strengths (confidence intervals also excluded 0 in these 20 cases). The other factors were rarely significantly associated with character strengths. In particular, the HDI did not show any significant association with character strengths; population density showed 9 small significant associations with character strengths; urbanization showed 7 significant associations with character strengths; temperature showed 12 positive associations with character strengths.

The median effect of the Gini index is $\beta=0.66$ (mean$=0.72$; SD$=0.30$). The R^2, as usually happens when including additional variables, always increased, apart from love of
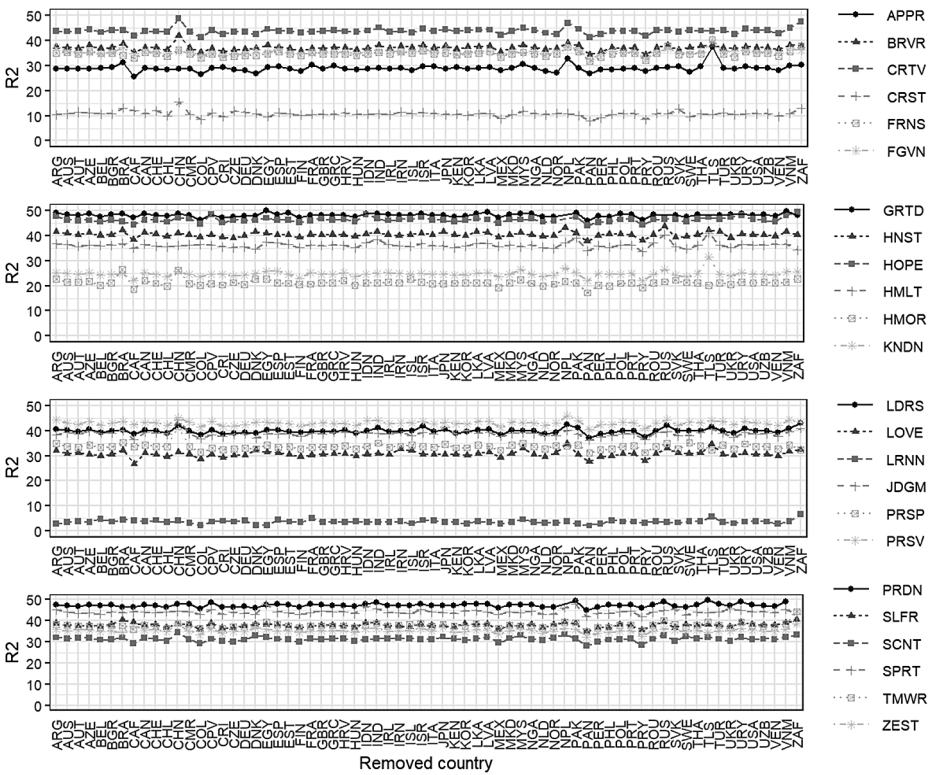
Fig. 2 Leave-one-out results: changes in R^2 Depending on the country removed from the analysis. *Note.* The list of the abbreviations with their corresponding country name is available in the dataset shared on Figshare: https://figshare.com/s/18f0dfffcb3f54872852

learning in which it decreased compared to the model with Gini index as the only predictor. All the results are reported in Table 4.

4 Discussion and Conclusions

Individuals think, behave, and feel according to biological, genetic, cultural, cognitive, and personality factors. Despite this, most of the psychological research on personality and character left out the role of contextual and environmental factors in shaping one's general thoughts, behaviors, and feelings (Oishi, 2014; Rentfrow, 2020), or, in other words, people's personality. Economic inequality is a structural aspect of the environment that is receiving more and more attention, mainly due to its consequences for justice and well-being (Peters & Jetten, 2023; Wilkinson & Pickett, 2017). Here we suggest that economic inequality might affect our personality and/or perception of ourselves. Few studies tested the association between inequality and personality (de Vries et al., 2011; Loughnan et al., 2011) and their results are mixed and generally relied on a small number of countries or USA regions only, thus requesting further and larger samples to provide more robust and generalizable findings. In addition, previous studies usually focused on classic personality traits and not

Table 4 Results of the metaregressions with gini index and other country indicators as predictors of character strengths

Strength	Gini	HDI	Population density	Urbanization	Temperature	R^2
Appreciation of beauty	0.77*** [0.33; 1.21]	−0.26 [-0.65; 0.12]	−0.01 [-0.13; 0.11]	−0.21 [-0.43; 0.02]	−0.05 [-0.18; 0.08]	46
Bravery	0.63** [0.18; 1.08]	−0.05 [-0.44; 0.34]	−0.13* [-0.26; −0.01]	−0.14 [-0.37; 0.08]	0.13 [-0.01; 0.26]	48
Creativity	0.62** [0.24; 1]	−0.13 [-0.46; 0.20]	−0.09 [-0.19; 0.01]	−0.10 [-0.29; 0.09]	0.11 [0.00; 0.22]	56
Curiosity	0.40 [-0.02; 0.81]	0.30 [-0.06; 0.67]	−0.13* [-0.25; −0.02]	−0.12 [-0.34; 0.09]	0.07 [-0.06; 0.19]	14
Fairness	0.60** [0.15; 1.05]	0.06 [-0.33; 0.45]	−0.14* [-0.26; −0.01]	−0.18 [-0.41; 0.05]	0.16* [0.02; 0.29]	47
Forgiveness	0.53** [0.18; 0.88]	0.06 [-0.25; 0.37]	−0.15** [-0.25; −0.06]	−0.25** [-0.43; −0.07]	0.11* [0.00; 0.21]	58
Gratitude	1.04*** [0.55; 1.53]	−0.09 [-0.51; 0.33]	−0.08 [-0.22; 0.05]	−0.25 [-0.49; 0.00]	0.17* [0.03; 0.32]	64
Honesty	0.77*** [0.35; 1.18]	0.08 [-0.28; 0.44]	−0.06 [-0.17; 0.06]	−0.21* [-0.42; 0.00]	0.12 [-0.01; 0.24]	50
Hope	1.13*** [0.60; 1.67]	−0.15 [-0.62; 0.31]	−0.09 [-0.24; 0.05]	−0.27 [-0.53; 0.00]	0.12 [-0.04; 0.28]	62
Humility	0.70** [0.25; 1.15]	0.0 [-0.40; 0.39]	−0.02 [-0.14; 0.11]	−0.28* [-0.51; −0.05]	0.22*** [0.09; 0.36]	63
Humor	0.32 [-0.04; 0.69]	0.11 [-0.21; 0.44]	−0.18*** [-0.28; −0.08]	−0.14 [-0.33; 0.05]	0.10 [-0.01; 0.20]	35
Kindness	0.48 [-0.02; 0.97]	−0.03 [-0.45; 0.40]	−0.14 [-0.27; 0.00]	−0.25* [-0.50; 0.00]	0.14 [-0.01; 0.28]	43
Leadership	0.76** [0.30; 1.21]	0.12 [-0.28; 0.52]	−0.16* [-0.29; −0.04]	−0.30* [-0.53; −0.07]	0.19** [0.05; 0.33]	59
Love	0.62** [0.19; 1.06]	−0.02 [-0.40; 0.36]	−0.07 [-0.18; 0.05]	−0.13 [-0.35; 0.09]	0.05 [-0.08; 0.18]	35
Love of learning	0.34 [-0.12; 0.79]	0.05 [-0.35; 0.45]	−0.07 [-0.20; 0.05]	−0.03 [-0.26; 0.20]	−0.03 [-0.17; 0.11]	1
Judgment	0.54** [0.02; 0.88]	0.09 [-0.21; 0.39]	−0.12* [-0.21; −0.03]	−0.14 [-0.31; 0.03]	0.11* [0.01; 0.21]	48
Perspective	0.56** [0.17; 0.96]	0.10 [-0.25; 0.45]	−0.05 [-0.16; 0.06]	−0.09 [-0.29; 0.11]	0.13* [0.01; 0.25]	37
Perseverance	0.96*** [0.44; 1.48]	0.06 [-0.39; 0.51]	−0.08 [-0.22; 0.06]	−0.22 [-0.48; 0.05]	0.16* [0.01; 0.31]	52
Prudence	0.98*** [0.52; 1.44]	−0.06 [-0.46; 0.33]	0.00 [-0.13; 0.13]	−0.16 [-0.39; 0.07]	0.13 [0.00; 0.27]	58
Self-regulation	0.78*** [0.35; 1.22]	0.18 [-0.20; 0.55]	0.00 [-0.11; 0.12]	−0.21 [-0.43; 0.01]	0.16* [0.03; 0.29]	49
Social intelligence	0.65** [0.20; 1.09]	0.11 [-0.28; 0.50]	−0.07 [-0.2; 0.05]	−0.14 [-0.36; 0.09]	0.10 [-0.03; 0.23]	34
Spirituality	1.72*** [0.94; 2.51]	−0.38 [-1.06; 0.30]	0.00 [-0.22; 0.22]	−0.51* [-0.90; −0.11]	0.31** [0.08; 0.55]	72
Teamwork	0.79** [0.26; 1.32]	0.16 [-0.30; 0.62]	−0.16* [-0.31; −0.02]	−0.29* [-0.55; −0.02]	0.24** [0.08; 0.39]	54
Zest	0.66** [0.19; 1.13]	0.19 [-0.22; 0.61]	−0.14* [-0.28; −0.01]	−0.21 [-0.45; 0.03]	0.20** [0.06; 0.34]	47

Note. * = p<.05; ** = p<.01; *** = p<.001: CI=Confidence intervals

on character strengths. Strengths, being conceived as positive morally valued personality traits, are more malleable and are particularly important in difficult situations, such as living in highly unequal contexts (Melita et al., 2021; Sánchez-Rodríguez et al., 2019b). Indeed, character strengths support individuals to thrive in adverse situations (Niemiec, 2020), possibly helping their adjustment to the situation or developing personal qualities (e.g., character strengths) to face the difficulties encountered. For these reasons, our work might enhance the understanding of the effects of economic inequality on key aspects of human character and consequently on the way we think, behave, and feel in a "good" way.

Building on previous literature linking economic inequality with the perception of a competitive normative climate (e.g., Sánchez-Rodríguez et al., 2023), we initially considered three plausible alternative hypotheses: A positive link between inequality and character strengths (H1), a negative link between the two (H2), or a mix of positive and negative links between them (H3). Through a set of meta-regressions associating inequality with the 24 character strengths across 68 countries, we found a strong and consistent positive effect of economic inequality on almost all the character strengths, except for curiosity and love of learning and supporting the idea that character strengths share common variance between them (Feraco et al., 2023). This might indicate that people living in more unequal countries report higher levels of character strengths, supporting H1. In general, the effect was large in magnitude, explaining an average of 34% (median = 37%) of the between-countries variance in character strengths and was consistent across different analyses. In fact, a sensitivity analysis using a leave-one-out (country) procedure and another set of meta-regressions controlling for countries' Human Development Index (i.e., HDI, which includes education, life expectancy, and GNI pro capita), population density, urbanization, and average temperature, still showed a statistically significant effect of inequality on 20 out of the 24 character strengths. Notably, while character strengths were consistently associated with inequality (i.e., the Gini index), their association with the other indices was smaller and rarely significant. This may highlight the specific role of economic inequality compared to other socioeconomic indices.

Such results support the hypothesis that people living in more unequal contexts perceive the context as more competitive and individualistic (Sánchez-Rodríguez et al., 2023) and this may enhance their need to cope with this adverse situation and develop their best qualities (i.e., character strengths) to appear more desirable to others. Both using them to face difficulties and continuously trying to be more socially desirable could boost character strengths in the long run. In other words, the competitiveness prompted by inequality and the need for self-enhancement could drive people to modify their character. This is a novel and intriguing finding as it shows for the first time that a large-scale structural and environmental factor that poses challenges and difficulties to inhabitants might also induce people to strengthen their character.

The present study has various limitations. The most noteworthy is that the data may not be completely representative of the countries' populations. In fact, McGrath (2015) reports a high level of education and highlights that the participants are all interested or aware about character and virtues. This limitation allows us to extend our results to a smaller fraction of the population and future studies should try to reach more representative samples. We also couldn't precisely test why we found a positive association between the Gini index and the level of character strengths. Future studies might try to answer this question by controlling for social desirability or self-enhancement to ensure that our results remain consistent after

accounting for these possibly explanatory factors. It might also be that, after accounting for desirability, the association between character strengths and economic inequality reverse, in line with what has previously been found for agreeableness (de Vries et al., 2011). Future studies might also be interested in understanding whether the well-known effect of character strengths on well-being and life satisfaction changes according to the country's level of economic inequality because our data do not support the hypothesis that countries that theoretically have higher levels of well-being also show higher levels of character strengths. It would also be important to replicate our results with a more recent sample. In fact, the data used are from a decade ago, and inequality has recently been increasing in most Western countries (Coffey et al., 2020). This calls for an update of the results; however, it could also provide the opportunity to test whether changes in economic inequality in the last ten years are associated with mean-level changes in individuals' character strengths in the corresponding countries. A further limitation concerns the correlational nature of our study, that being cross-sectional cannot be used to infer causality between the variables studied, but neither are other studies on the topic (de Vries et al., 2011). Future research may use different methods (experimental or longitudinal) to provide more accurate results of the link found but is still unknown how much inequality should change (within a country) to affect personal characteristic and, in case, how much we should wait to observe such personal change after inequality increases or decreases. Although we envision a causal link from economic inequality to character strengths, this does not exclude the possibility that the reverse causal direction could also be true.

As a conclusion, we would want to state that our findings should not be interpreted or used to support higher inequality and we do not think that economic inequality is a worthwhile opportunity for character development. However, we believe that our results suggest that contextual, environmental, and social factors matter – for the good or the bad – in shaping our character and more research should be focused on such cultural, environmental, and social aspects if we want to understand human personality, behavior, emotions, or thoughts.

Data Availability Data are available on Figshare with permissions from professor McGrath: https://figshare.com/s/18f0dfffcb3f54872852.

Code Availability The code used for the analysis is available on Figshare at the following link: https://figshare.com/s/0d812d187f7bc6dc1af1.

Declarations

Conflict of interest The authors have no potential conflicts of interest to report.

Ethics Approval and Consent to Participate The study only includes analyses of aggregated data previously collected by the VIA Institute of Character following their privacy policies.

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