

ORIGINAL ARTICLE

Effects of objective and subjective indicators of economic inequality on subjective well-being: Underlying mechanisms

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Funding information

Italian Ministry of Education, University and
Research (MIUR), Grant/Award Number:
PRIN-2017-2017924L2B

Abstract

Much research found that economic inequality—the dispersion of incomes distribution among individuals in a society—affects subjective well-being (SWB). As a meta-analysis has shown, the association between economic inequality, commonly measured by the Gini index, and individuals' SWB is weak and not significant. Psychosocial research suggests that the situational perception, rather than objective reality, has a greater impact on individuals. Our aim was to investigate whether and how objective and subjective measures of economic inequality affect the subjective individuals' well-being, both in its affective and cognitive components. A representative Italian sample ($N = 1446$, 51% women; average age = 42.42 years, $SD = 12.87$) answered an online survey. Multilevel regressions detected a negative and significant effect of the inequality perception on well-being. In contrast, the Gini index showed no effect. Two psychological mechanisms explain the association between perceived inequality and well-being: Perceived anger toward inequality and individuals' economic vulnerability. The parallel mediation models showed that the effect of perceived inequality is conveyed by cognitive (economic vulnerability) and emotional (anger) processing of inequality. Findings also highlighted the role of the ongoing COVID-19 pandemic.

1 | INTRODUCTION

Economic inequality—the wealth gap between people at the top and at the bottom of a society—is arguably the defining societal issue of the 21st century (Hauser & Norton, 2017). Globally, inequality is increasing for more than 70% of the population, accelerating divisions and hampering economic and social progress (United Nations, 2021). Moreover, the COVID-19 pandemic has possibly amplified existing economic inequalities by penalizing mostly workers with unstable and less protected jobs (Aspachs et al., 2021).

According to research, economic inequality can affect subjective well-being (SWB; Buttrick et al., 2017; Wilkinson & Pickett, 2009). However, a recent meta-analytic study did not support the association between economic inequality, measured by objective indicators of inequality such as the Gini index, and SWB (Ngamaba et al., 2018). The inconsistency between findings may be partly explained by the ecological fallacy, the assumption that relationships at the macro-level necessarily apply to everyone in the group (Lavralcas, 2008). Indeed, contextual inequality may have varying effects on individuals, even though the overall effect does not change (Brown-Iannuzzi et al., 2017). Thus, solely relying on macro-level

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measures of inequality, especially if combined with ecological fallacy, may distort the relationship between inequality and SWB. Relatedly, macro-level representation of economic inequality does not provide any insight into how individuals experience it (Brown-Iannuzzi et al., 2017). As social psychological research indicates, people's perception of a situation is likely to have greater effects on behavior than the objective reality of that situation (e.g., Lewin, 1939). A recent cross-cultural study, for instance, evidenced that perceived levels of inequality influence attitudes towards cross-country economic inequality more than objective measures (i.e., Gini index; Gáspár, Cervone, Durante, Maass, et al., 2022). Hence, studying the personal understanding of economic inequality may be especially relevant for determining whether and how—through which mechanisms—economic inequality influences SWB. This suggests that it is important that both individual perceptions and macro-level context of inequality are considered when studying the effects of economic inequality on SWB (Mendoza-Denton & Mischel, 2007).

The current research investigates whether and how objective (i.e., Gini index) and subjective (i.e., individual's perception) measures of economic inequality influence people's SWB and explores the psychological mechanisms that may explain their relationships.

1.1 | SWB

SWB refers to how people experience and evaluate their lives and specific domains and activities in their lives (Stone & Mackie, 2013). The hedonic model of SWB refers to one's belief or feeling that life is going well and is considered as one of the best available proxy measures for a broader, more general sense of well-being (Diener et al., 2018). Hedonic well-being has been conceptualized as comprising affective and cognitive evaluations of one's life (Diener, 1984). The affective component is conceptualized as affective evaluations of how individuals feel as they go about their daily lives (Gallagher et al., 2009). The cognitive component, on the other hand, is conceptualized as the way people evaluate their life as a whole in relation to a self-imposed ideal (Diener, 1984). Hence, one important distinction in the SWB conceptualization is the contrast between a more affective evaluation (e.g., asking about a person's emotional experience) and a more cognitive, judgment-focused evaluation (e.g., life satisfaction; Diener et al., 2018). In the current research, we investigate the effects of objective and perceived economic inequality on both the cognitive and affective components of the hedonic SWB.

1.2 | Objective economic inequality and SWB

Several measures exist to quantify the dispersion of economic resources across households. The most common is the Gini index, a coefficient that ranges from 0 to 1, where 0 corresponds to complete equality and 1 corresponds to complete inequality. Compared to other inequality measures, which only compare the

income differences between two groups (e.g., the 80–20 interquintile share ratio), the Gini index considers every point in the distribution.

Studies on the relationship between economic inequality, mostly measured through the Gini index, and SWB have produced inconsistent results. Some researchers find an overall positive effect, while others report negative effects or no significant outcomes whatsoever (for a meta-analysis, see Tan et al., 2020). Particularly, Ngamaba et al. (2018) meta-analyzed 24 independent studies whose results did not support a link between inequality and SWB in general. Further analysis revealed that the association is influenced by neither the operationalization of inequality nor the measures used to assess SWB.

In 2018, the estimated value of the Gini coefficient for Italy was 0.328, slightly decreasing compared to 2017 (0.334) but higher compared to other major European countries (Eurostat, 2019). In the ranking of the EU-28 countries for which the Gini coefficient is available, Italy was in the 19th position. Most of the income disparity is explained by regional differences (Brandolini & Torrini, 2010). Southern regions are typified by a lower household income and also by a much higher inequality: The Gini index for the South and the two major islands (i.e., Sardinia and Sicily) was almost four percentage points higher than in the Center-North in 2018 (Istat, 2021). This study will consider the Italian regional estimated Gini index as an objective measure of inequality to establish whether differences in regional inequality might affect individuals' cognitive and affective facets of SWB.

1.3 | Perceived economic inequality and SWB

Many economic phenomena can have objective and subjective facets. The socioeconomic status (SES), for instance, is considered to have both an objective and subjective component (Kraus et al., 2012). The distinction between objective and subjective components may be applied to inequality. Objective inequality represents the relative degree of income dispersion in a population. However, individuals may not always be aware of the actual degree of objective inequality (Gimpelson & Treisman, 2018; Norton & Ariely, 2011; see also Hauser & Norton, 2017) and, also, people struggle in making accurate intuitive predictions of an actual outcome distribution (e.g., Kahneman & Tversky, 1973). Thus, considering the subjective component of inequality is crucial to understand its psychological impacts. Subjective inequality can be considered as an individual-level construct of how individuals perceive economic inequality in their society (Schmalor & Heine, 2021). Our understanding of the effects of economic inequality will improve in many ways if its subjective component is taken into consideration. First, as said, objective inequality measures tend to be skewed by the assumption that people from the same geographical area—thus, with the same Gini coefficient—will experience the same inequality (i.e., ecological fallacy). Second, subjective inequality exists at an individual level as opposed to

objective inequality and, thus, researchers can assess whether it is associated with other psychological constructs (e.g., SWB). Third, individuals' perception of inequality may be influenced by their personal characteristics (e.g., demographics and personality), social networks, cultural and ideological backgrounds, which cannot be captured considering objective inequality. Thus, even though objective economic inequality has emerged as an influential socioecological factor affecting individuals' thinking, feelings, and behaviors (Connor et al., 2019; Côté et al., 2015; DeCelles & Norton, 2016; Du et al., 2019; Loughnan et al., 2011; Payne et al., 2017; Sprong et al., 2019; Walasek & Brown, 2015), we might expect that the subjective experience of economic inequality will show a greater impact on psychological outcomes (e.g., SWB) than objective inequality. Research on subjective inequality have focused on how accurately people perceive inequality in wages and how these perceptions predict individuals' SWB. For example, a widely used measure requires quantifying the salaries of a chairman and an unskilled factory worker (Jasso, 2009). Then, the ratio between the two quantities is calculated (for a more sensitive way to calculate such a ratio, see Gáspár, Cervone, Durante, Suitner, et al., 2022). In some research, the estimated wage inequality is negatively associated with life satisfaction (Schneider, 2012), while in some others, the two constructs are not related (García-Castro et al., 2019). This inconsistency might be explained by the difficulty in estimating the earnings of someone on the lowest or highest rung of a company. This, in turn, can generate a high variance in the response. Further, people use malleable heuristics when uncertain about how much more or less individuals earn in a particular context (Page & Goldstein, 2016). When people are uncertain about the relative amount of earnings within a specific context, they start with one value (an "anchor") and then adjust away from it (Pedersen & Mutz, 2019).

Given the methodological limitations of the available measure of subjective inequality, it may be important to measure it by asking people to express their own experience of inequality in lay terms without endorsing more difficult evaluations. To date, very little research has explored whether the subjective experience of inequality is correlated with the same psychological and social constructs as objective inequality. Regarding SWB, initial evidence showed that Americans who perceived more inequality reported less life satisfaction (Schmalor & Heine, 2021). Accordingly, few studies have investigated the psychological mechanisms to explain the link between the perception of the societal phenomenon and SWB. Some initial evidence shows that perception of inequality worsens individuals' health and well-being partly because it undermines individuals' sense of stability and order (Sprong et al., 2019), which triggers psychological distress and existential anxiety (Gugushvili et al., 2020). Our research aims to add some evidence on the relationship between subjective evaluations of inequality and SWB by assuming that perceived anger toward inequality and economic vulnerability should mediate this association. In the following section, we provide the rationale for our hypothesis.

1.4 | Perceived economic inequality and SWB: The role of anger and economic vulnerability

According to Lazarus and Folkman's (1984) appraisal theory, the cognitive appraisal of a stressor determines the significance and meaning of events, which in turn impacts individuals' well-being. Specifically, appraisal of economic inequality might disclose to the individual the imbalance between perceived external or internal demands and the perceived personal and social resources to deal with them. The psychological stress that derives from stressor appraisal can be defined as: "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (Lazarus & Folkman, 1984, p. 19). Economic inequality might be considered a stressor since it threatens individuals' well-being through poverty and economic deprivation (Ribeiro et al., 2017) and can be emotionally arousing (Hauser & Norton, 2017).

In our study, we tested two psychological mechanisms. First, we suggested that economic vulnerability—the subjective perception of one's financial situation and related worries—is a factor that may play a role in explaining why the perception of economic inequality lowers individuals' SWB. Indeed, the sense of a precarious, vulnerable economic condition evoked by economic inequality (Roth et al., 2017) may threaten people's possibility of making plans and envisioning the future and in turn, this may negatively impact both facets of SWB (Dolan et al., 2008; Kahneman & Deaton, 2010). Based on such findings, we expect that perceiving higher levels of economic inequality would enhance the perception of economic vulnerability, negatively impacting SWB. Second, the appraisal of economic inequality may also be followed by an emotional reaction, in particular of negative valence (e.g., anger and anxiety), which negatively impacts SWB (Spielberger & Reheiser, 2009). Individuals' appraisal of economic inequality encompasses not only the perception of the phenomenon wideness (i.e., income differences between poor and rich people are wide) but also its unfairness (i.e., large income differences between poor and rich people are unfair; Valtorta et al., 2022). Perceiving that a moral standard (i.e., fairness) has been violated (Hoffman, 2000; Montada & Schneider, 1989) provokes moral outrage, a prevalent and powerful, even prototypical, moral emotion (Haidt, 2003). While some evidence demonstrates that experiences of unfairness are associated with a wide range of emotions (Cohen-Charash & Byrne, 2008), we focused specifically on moral anger as there is systematic evidence linking it to unfair processes and outcomes (Mikula et al., 1998; Weiss et al., 1999). Thus, as economic inequality serves as a stressor, it should thus also influence individuals' perceived anger toward the phenomenon, negatively impacting SWB. In this study, we hypothesize that the effect of perceived economic inequality on SWB would be mediated by individuals' perceived outrage toward economic inequality.

2 | THE CURRENT STUDY

This study primarily aims to explore and compare the effects of objective (i.e., Gini index) and subjective (i.e., perceived inequality) indicators of economic inequality on individuals' affective and cognitive components of SWB with a representative sample of the Italian population. In doing so, we will consider the Italian regional Gini index as an objective measure of inequality and a scale assessing the perceived level of inequality along with the perception of its unfairness Valtorta et al., 2022) as the subjective measure of perceived inequality. Indeed, some researchers argued that individuals oppose economic unfairness more so than inequality per se (Starmans et al., 2017). We expect that perceived economic inequality would show a greater effect on both cognitive (Hypothesis 1a) and affective (Hypothesis 1b) facets of SWB than the Gini index. In addition, we used a measure of subjective wage inequality to compare its effect with that of perceived inequality. Given the difficulty of individuals to estimate wages, we expect this measure to show a smaller effect on both cognitive (Hypothesis 2a) and affective (Hypothesis 2b) SWB than perceived inequality.

Finally, we aim to investigate two possible psychological mechanisms that may explain the relationship between perceived economic inequality and SWB, that is the mediating role of anger toward inequality and economic vulnerability. We expect that perceived anger toward inequality and economic vulnerability would negatively mediate the relationship between perceived economic inequality and cognitive (Hypothesis 3a) and affective (Hypothesis 3b) SWB.

2.1 | Ancillary research questions

The socioeconomic standing of an individual or group influences SWB. SES can be defined both objectively and subjectively (Adler et al., 2000). Meta-analytic research found that SES is positively related to SWB, so that the higher the individuals' social standing, the higher is their SWB. However, this association is stronger for the subjective SES than the objective SES (Tan et al., 2020). According to the relativity hypothesis (Diener et al., 1993), this pattern emerges because subjective SES is rooted in social comparison compared to objective SES: People care more about how much they have compared with others than simply how much they have in absolute terms. In our study, we expect to find that subjective and objective SES are positively related to SWB. Still, subjective SES would show a stronger effect on SWB than objective SES.

Perceived social support refers to the extent individuals feel about the personal support that they receive from their family and friends (Lin et al., 2019). According to the hypothesis of relative deprivation (Walker & Pettigrew, 1984), economic inequality motivates individual-level socioeconomic comparisons, and these lead to worsened social relations, greater stress, and resulting poorer SWB (reviewed in Pickett & Wilkinson, 2015; Wilkinson & Pickett, 2006, 2009). In other words, perceived social support is a valuable psychosocial resource under stressful (economic) conditions. Much research documented that perceived social support is strongly associated with affective SWB (Jones et al., 2003; Stephens et al., 2002) and cognitive SWB (Jones

et al., 2003; Newsom & Schulz, 1996). For example, previous research has estimated that perceived social support accounts for more than half of the total variance in life satisfaction after controlling for dispositional negative affectivity (i.e., neuroticism; Kahn et al., 2003). Therefore, the relationship between perceived social support and SWB does not appear to be spurious and extends to different dimensions of SWB. Given that perceived social support is regarded as a valuable and stable protective mechanism that can assist in improving SWB (Liu et al., 2014), this covariate is expected to affect SWB positively.

Finally, this study considers the impact of the COVID-19 pandemic on SWB. Since its emergence in 2020, COVID-19 has had a massive impact on public health and changed the daily life of people worldwide. Based on evidence accumulated on previous pandemics, it was anticipated that the pandemic would bring negative consequences for physical health and for social, psychological, and economic aspects of individuals' lives (Holmes et al., 2020). Since the known effect of COVID-19 on individual SWB (Lieberoth et al., 2021), and considering that we collected data during an outbreak (January 2021), we took into account its impact on individuals' psychological health, financial situation, and resource procurement. To test our main hypotheses and obtain fair estimates of the effect of perceived inequality on SWB, we must parcel out the coronavirus personal impact's effect.

3 | METHODS

3.1 | Sample

A representative sample of 1497 Italians consented to participate in our cross-sectional study. The sample was stratified on gender, age, regional area of residency, education, and working status. The inclusion criterion was being at least 18 years of age. Participants were recruited from an Ipsos panel in January 2021. After excluding participants who did not complete the questionnaire ($n = 51$), the final sample comprises 1446. The study was conducted after receiving the ethical approval from the local commission of the Psychology Department for minimal risk studies.

Participation was voluntary, and informed consent was obtained before data collection. All participants were informed that the data collection was anonymous and that they could withdraw from the study at any time. Participants who completed the survey were reimbursed for their collaboration directly by the external agency, according to national rules.

In the current study, we used both individual- and macro-level variables, the latter measured at the regional area level.

3.2 | Individual-level measures

Individual-level variables were collected using a survey implemented on Qualtrics (2005). The survey took 25 min to complete. The order of the scales within the survey was fixed, while the order of the items within each scale was randomized. All the scales and the original questionnaire

used are enlisted on the project OSF page (<https://osf.io/r76ew/>). In the Supporting Information we reported full details of the items that are relevant to this study and the psychometric properties of the scales (Supporting Information: Table S1).

3.2.1 | Demographic information

Information about participants' gender, age, and region of residency (i.e., 20 regions clustered into 5 regional areas, i.e., North-West, North-East, Center, South, and Islands, according to the Italian National Institute of Statistics (Istat) geographical division) were collected. Households' net annual income was measured with the 5-point scale (1 = *less than 13,522 Euros*; 5 = *more than 48,255 Euros*) provided by the Bank of Italy and Istat (2021). Participants' education was assessed on a 6-point scale (1 = *less than high school*; 6 = *PhD*). Finally, working status and job prestige were assessed using the recommendations provided by the Istituto Carlo Cattaneo, a research institute that investigates Italy's socioeconomic and political conditions (Gentili, 2018). Table 1 summarizes the characteristics of the sample.

3.2.2 | Satisfaction with life scale (Diener et al., 1985)

This self-report measure assesses global life satisfaction, the cognitive facet of SWB as conceived by the hedonic model of well-being. The measure is composed of five items (e.g., "I am satisfied with my life") answered on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*). The items compose a single factor structure and are consistent ($\alpha = .88$). The total score was calculated by averaging the items. Higher values indicate higher life satisfaction.

3.2.3 | Psychological general well-being index (Grossi et al., 2006)

The scale measures the general evaluation of self-perceived well-being, the affective facet of SWB as conceived by the hedonic model of well-being. In this study, we used four items from the original scale (e.g., "I felt cheerful, lighthearted during the past month"). Respondents were asked to rate each item using a 6-point scale (1 = *never*; 6 = *all of the time*). The items compose a single factor structure and are consistent ($\alpha = .78$). The total score was calculated by averaging the items. Higher values indicate higher well-being.

3.2.4 | Perceived economic inequality scale (Valtorta et al., 2022)

Seven items were developed to assess perceived inequality in society (e.g., "In Italy there are few very rich people and many very poor

TABLE 1 Sample description by sociodemographic characteristics

Variable		Value
Gender	Female (%)	742 (51.42%)
	Male (%)	701 (48.58%)
	Other (%)	3 (0.20%)
Mean age (SD)		42.42 (12.87)
Education	Less than high school (%)	116 (8.00%)
	Professional diploma (%)	106 (7.30%)
	High school diploma (%)	973 (67.30%)
	Bachelor degree (%)	104 (7.20%)
	Master degree (%)	131 (9.10%)
	Doctorate (%)	16 (1.10%)
Regional area of residency	North-West (%)	383 (26.50%)
	North-East (%)	281 (19.40%)
	Center (%)	289 (20.00%)
	South (%)	334 (23.10%)
	Islands (%)	159 (11.00%)
Working status	Employed (%)	760 (52.60%)
	Unemployed and in search (%)	251 (17.40%)
	Unemployed and not in search (%)	132 (9.10%)
	Retired (%)	123 (8.50%)
	Full-time university student (%)	142 (9.80%)
	Never worked (%)	38 (2.60%)
Job prestige	High (%)	196 (13.60%)
	Medium (%)	630 (43.60%)
	Low (%)	438 (30.30%)
	Missing (%) ^a	182 (12.60%)
Income	Less than 13,522 euro/year (%)	341 (23.60%)
	Between 13,500 and 20,425 euro/year (%)	368 (25.40%)
	Between 20,425 and 29,739 euro/year (%)	336 (23.20%)
	Between 29,739 and 48,255 euro/year (%)	307 (21.20%)
	More than 48,255 euro/year (%)	82 (5.70%)
	Missing (%)	12 (0.80%)

^aThe data for 180 participants is missing because we did not ask additional job information to full-time university students and those who never worked. Two participants did not answer the question.

people"). All items were answered on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*). The items compose a single factor structure and are consistent ($\alpha = .86$). The total score was calculated by averaging the items, and higher values indicate higher perception of inequality.

3.2.5 | Perceived wage inequality—Individual gini (Jasso, 2009)

Participants were asked to quantify the average monthly salaries of the highest-ranking employee and the lowest-ranking employee in a typical Italian company. The total score was computed following the procedure proposed by Kuhn (2020), which creates a score that represents an individual's perception of inequality in market wages and mimics the Gini index. Thirty-six participants (2%) did not answer one or both items. This low percentage of missing can be considered inconsequential for the analysis (Dong & Peng, 2013). Thus, we imputed missings using variable median.

3.2.6 | Perceived anger in response to perceived economic inequality

To assess how much anger respondents felt when thinking about economic inequality in Italy, we administered a single-item scale ("When you think about economic inequality in Italy, to what extent do you feel angry?"), which was answered on a 5-point scale (1 = *not at all*; 5 = *very much*).

3.2.7 | Economic vulnerability (Mari et al., 2017)

It measures to what extent people think their economic situation is vulnerable through five items (e.g., "How likely do you think that in 1 or 2 years you will not be able to pay the bills"). Participants answered on a 5-point scale (1 = *very unlikely*; 5 = *very likely*). The items compose a single factor structure and are consistent ($\alpha = .85$). The total score was calculated by averaging the items. Higher values express higher economic vulnerability.

3.2.8 | Objective SES

Objective SES was computed based on household income, the level of formal education achieved, and job prestige. We standardized all the measures and computed their mean (Adler et al., 2000).

3.2.9 | Subjective SES

For measuring participants' subjective SES, we employed the MacArthur ladder (Adler et al., 2000). Participants were presented

with an image of a ladder with 10 rungs, representing the socioeconomic standing of Italians: At the top of the ladder are the people who are the best off, while at the bottom are the people who are the worst off. Then, they were asked to indicate their position by selecting 1 of the 10 rungs. Higher values correspond to higher subjective SES.

3.2.10 | Perceived social support questionnaire (Lin et al., 2019)

It measures how much social support participants think to have through four items (e.g., "I experience a lot of understanding and security from others"). Items were rated on a 5-point scale (1 = *not true at all*; 5 = *very true*). The items compose a single factor structure and are consistent ($\alpha = .80$). The total score was calculated by averaging the items. Higher values indicate higher perceived social support.

3.2.11 | Coronavirus personal impacts (Conway et al., 2020)

The scale measures the financial, resource procurement, and psychological impacts of COVID-19 outbreak through six items (e.g., "The Coronavirus has impacted me negatively from a financial point of view," "I have become depressed because of the Coronavirus [COVID-19]"). The items were answered on a 5-point scale (1 = *strongly disagree*; 5 = *strongly agree*). The items compose a single factor structure and are consistent ($\alpha = .82$). The total score was calculated by averaging the items, and higher values correspond to greater impacts of COVID-19 outbreak on one's life.

3.3 | Macro-level measures

We used the Gini coefficient of the five country's regional areas as the objective measure of economic inequality. In addition, we controlled the effect of inequality for the level of economic prosperity by including a measure of Gross Domestic Product (GDP) per capita for each regional area. Both macro-level indices refer to 2018 (Istat, 2021). Supporting Information: Table S2 reports the values of both indices by the 5 regional areas and the 20 regions.

3.4 | Analytical approach

The data distributions were inspected, and descriptive analyses were performed (Table 2). We evaluated the psychometric properties of each measure by means of Items Analysis and Principal Component Analysis (see Supporting Information for the results).

TABLE 2 Descriptive statistics and correlations between variables

Variable	Mean (SD)—%	1	2	3	4	5	6	7	8	9	10	11	12
1. Cognitive SWB	2.95 (0.86)	1											
2. Affective SWB	3.59 (0.95)	.51***	1										
3. Perceived economic inequality	3.95 (0.71)	-.14***	-.09***	1									
4. Individual Gini	0.07 (0.02)	-.04	.03	.25***	1								
5. Objective SES	0.00 (0.73)	.18***	.14***	-.03	.09***	1							
6. Subjective SES	5.52 (1.51)	.44***	.29***	-.16***	-.08***	.35***	1						
7. Perceived social support	3.06 (0.80)	.39***	.29***	.02	-.02	.12***	.22***	1					
8. COVID personal impact	2.67 (0.87)	-.28***	-.51***	.05*	-.05*	-.20***	-.25***	-.15***	1				
9. Economic vulnerability	3.08 (0.87)	-.35***	-.41***	.20***	.01	-.24***	-.32***	-.15***	.56***	1			
10. Anger toward economic inequality	3.12 (1.15)	-.20***	-.31***	.43***	.08***	-.03	-.14***	-.03	.24***	.28***	1		
11. Age	42.44 (12.87)	.03	.20***	.09***	.19***	.07**	-.02	-.06*	-.14***	-.16***	-.08***	1	
12. Gender (female)	51.42%	-.07*	-.15***	.04	-.02	-.12***	-.04	-.02	.03	.12***	.07*	-.06*	1

Note: The correlations with gender were estimated through the point-biserial correlation.

Abbreviations: SES, socioeconomic status; SWB, subjective well-being.

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

We computed Pearson and point biserial correlations to investigate the relationships between variables measured at the individual level (Table 2).

Multilevel regression analyses were conducted, with respondents nested within the macro-regional area of residency, to assess the effects of individual and macro independent variables on life satisfaction and psychological well-being. The continuous variables measured at the individual level were group-mean centered, and higher-level variables were grand-mean centered (Heck & Thomas, 2020). Given the low number of considered groups at the macro-level (i.e., five regional areas), we estimated the regression parameters through the restricted maximum-likelihood as suggested by Elff and colleagues (2020).

We computed the intraclass correlation (ICC) of the null random intercept model and it showed to be particularly low for life satisfaction (ICC = 0.0007); while for well-being it was higher (ICC = 0.003). Thus, to improve estimations at level-2 (Leyland & Groenewegen, 2020), the same multilevel analyses were performed by nesting individuals in regions ($N = 20$) (see Supporting Information: Tables S3 and S4). In this case the ICCs were higher for both dependent variables (ICC_{life.satisfaction} = 0.003; ICC_{well.being} = 0.006). The pattern of results is similar with both conceptualizations of the macro-level variable (5 regional areas vs. 20 regions).

Three hierarchical multilevel models were tested for each dependent variable (i.e., cognitive and affective SWB) and compared using the likelihood ratio test. Model 1 included the fixed effects of the control variables measured at the individual level (i.e., perceived wage gap, subjective SES, objective SES, perceived social support, and COVID-19 personal impact) and the objective indicators measured at the regional level (i.e., Gini index and GDP per capita). In Model 2, perceived economic inequality was introduced as a fixed factor. In Model 3, we tested the micro-macro interaction between perceived economic inequality and the Gini index and introduced the random slope for the main predictor. Indeed, research pointed out that when including cross-level interactions, multilevel models should include this term (Bell et al., 2019; Heisig & Schaeffer, 2019). Finally, in Model 4, perceived anger toward inequality and economic vulnerability measures were introduced as fixed factors.

Next, we analyzed whether the relationship between perceived inequality and SWB is mediated by anger toward inequality and economic vulnerability while controlling for significant covariates. We performed a parallel mediation analysis with bootstrap effects estimation (1000 bootstrap samples).

Data analyses were performed using R version 4.0.5 (R Development Core Team, 2021). Specifically, we used *lme4*

(Bates et al., 2015) for multilevel modeling, and *lavaan* (Rosseel, 2012) for the mediation analyses.

4 | RESULTS

4.1 | Correlations between SWB and the other measured variables

Perceived economic inequality negatively correlates with the cognitive and, to a lesser extent, with the affective facets of SWB (Table 2). Despite a positive relationship between perceived inequality and individual Gini, which might suggest a conceptual similarity between the two constructs, the latter is not associated with SWB measures. As expected, SWB measures are positively associated with both subjective SES and, to a lesser extent, objective SES (Tan et al., 2020). SWB measures are positively associated with perceived social support and negatively with the impact of COVID-19 on individuals' life. Finally, SWB measures are negatively associated with both perceived anger toward inequality and economic vulnerability. These two constructs also show small to moderate positive correlations with perceived inequality.

4.2 | Effects of objective and subjective indicators of economic inequality on cognitive SWB

Model 1 (Table 3) indicates that subjective SES and perceived social support are positively associated with the cognitive facet of SWB (i.e., life satisfaction), while COVID-19 personal impact shows a negative association. In addition, individual Gini was not associated with life satisfaction. Regarding the macro-level predictors, neither the Gini index nor the GDP per capita significantly predicts life satisfaction. By introducing the fixed effect of perceived economic inequality (Model 2), the model shows a better fit to the data than Model 1, $\chi^2(1) = 12.95$, $p < .001$. As expected, perceived economic inequality negatively predicts life satisfaction so that those who have a greater perception of inequality are less satisfied with their life. The fact that perceived inequality predicts the cognitive component of SWB while both the Gini index and the individual Gini do not, favors our Hypotheses 1a and 2a. In Model 3, we tested the interaction between Gini index and perceived inequality for exploratory purposes, but it is not significant. This model also shows that introducing the random slope for the main predictor does not improve model performance, $\chi^2(3) = 0.33$, $p = .953$. Finally, we introduced perceived anger toward inequality and economic vulnerability in Model 4, which fits the data better than Model 3, $\chi^2(2) = 36.40$, $p < .001$. Both predictors negatively affect life satisfaction, but the effect of economic vulnerability is greater than the effect of anger toward inequality. It is worth noting that by introducing these two predictors in the model, the effect of perceived inequality disappears. This supports the mediation hypotheses that underlie the association between perceived inequality and SWB.

4.2.1 | Mediation analysis

As Table 5 shows, the effect of perceived economic inequality on life satisfaction is fully mediated via the perceived anger toward economic inequality and economic vulnerability (Figure 1), thus, supporting Hypothesis 3a. Specifically, we found significant negative indirect effects through perceived anger toward inequality and economic vulnerability. Thus, perceiving higher levels of inequality enhance the anger toward the phenomenon and the perceived economic vulnerability, reducing individuals' life satisfaction.

4.3 | Effects of objective and subjective indicators of economic inequality on affective SWB

The results of Model 1 (Table 4) indicate that subjective SES and perceived social support positively predict the affective component of SWB. At the same time, objective SES and COVID-19 personal impact show negative associations with the outcome. Regarding the macro-level predictors, neither the GDP per capita nor the Gini index significantly predict affective well-being. As for life satisfaction, Model 2 fit the data better than Model 1, $\chi^2(1) = 8.56$, $p = .003$. Perceived inequality negatively predict the affective component of SWB, so that those who show a greater perception of economic inequality feel less well. The fact that perceived inequality is predictive of the outcome, whereas Gini index and individual Gini are not, favors Hypotheses 1b and 2b. In Model 3, we tested the interaction between the regional Gini index and perceived economic inequality, but it is not significant. As for life satisfaction, introducing the random slope for the main predictor does not improve model performance, $\chi^2(3) = 2.50$, $p = .475$. Finally, once introducing perceived anger toward inequality and economic vulnerability, Model 4 fits the data better than Model 3, $\chi^2(2) = 65.31$, $p < .001$. Both predictors significantly and negatively impact the affective component of SWB, with anger toward inequality showing a greater effect than economic vulnerability. As for life satisfaction, these two additional predictors wipe out the effect of perceived economic inequality, supporting once again their hypothesized mediating effects.

4.3.1 | Mediation analysis

Similar to the mediation results for life satisfaction, the effect of perceived economic inequality on the affective facet of SWB was fully mediated via perceived anger toward economic inequality and economic vulnerability (Figure 2), thus, supporting Hypothesis 3b. Specifically, we found significant negative indirect effects through perceived anger toward inequality and economic vulnerability (Table 5). In other words, perceiving more inequality enhanced the anger toward the phenomenon and the perceived economic vulnerability, reducing individuals' affective SWB.

TABLE 3 Results of the multilevel regressions on cognitive SWB (i.e., life satisfaction)

Fixed effects	Model 1			Model 2			Model 3			Model 4		
	β	95% CI	pValue	β	95% CI	pValue	β	95% CI	pValue	β	95% CI	p Value
Individual level												
Intercept	0.04	-0.02 to -0.10	.345	0.04	-0.02 to -0.10	.233	0.04	-0.02 to -0.10	.250	0.03	-0.04 to -0.09	.682
Individual Gini	-0.03	-0.07 to -0.02	.263	-0.01	-0.05 to -0.04	.803	-0.01	-0.05 to -0.04	.791	-0.01	-0.05 to -0.04	.783
Objective SES	-0.01	-0.06 to -0.03	.561	-0.01	-0.06 to -0.03	.561	-0.01	-0.06 to -0.03	.545	-0.02	-0.07 to -0.03	.396
Subjective SES	0.34	0.30 to 0.39	<.001	0.33	0.28 to 0.38	<.001	0.33	0.28 to 0.38	<.001	0.31	0.26 to 0.36	<.001
Perceived social support	0.29	0.25 to 0.34	<.001	0.30	0.25 to 0.34	<.001	0.30	0.25 to 0.34	<.001	0.29	0.25 to 0.33	<.001
COVID-19 personal impact	-0.15	-0.19 to -0.10	<.001	-0.15	-0.19 to -0.10	<.001	-0.15	-0.19 to -0.10	<.001	-0.07	-0.12 to -0.01	.014
Age	0.04	-0.01 to -0.08	.108	0.04	-0.00 to -0.09	.067	0.04	-0.00 to -0.08	.076	0.02	-0.03 to -0.06	.424
Gender (female)	-0.08	-0.17 to -0.01	.075	-0.07	-0.16 to -0.02	.107	-0.07	-0.16 to -0.02	.113	-0.05	-0.13 to -0.04	.290
Gender (other)	-0.96	-1.90 to -0.01	.047	-0.93	-1.87 to -0.02	.054	-0.94	-1.88 to -0.01	.052	-0.84	-1.77 to -0.09	.075
Perceived economic inequality				-0.08	-0.13 to -0.04	<.001	-0.08	-0.14 to -0.02	.007	-0.03	-0.08 to -0.03	.343
Economic vulnerability										-0.14	-0.19 to -0.08	<.001
Anger toward inequality										-0.07	-0.12 to -0.02	.003
Regional-level												
Gini	0.07	0.06 to 0.19	.299	0.07	-0.06 to 0.19	.300	0.07	-0.06 to 0.20	.299	0.07	-0.05 to 0.19	.280
GDP per capita	0.11	-0.02 to 0.23	.097	0.11	-0.02 to 0.23	.098	0.11	-0.02 to 0.24	.098	0.11	-0.01 to 0.23	.088
Cross-level interaction												
Perceived economic inequality X Gini							0.01	-0.04 to 0.07	.619	0.02	-0.03 to 0.06	.498
Random effects												
σ^2_e		0.831			0.827			0.827			0.818	
σ^2_o		0.001			0.001			0.001			0.012	
σ^2_1				0.056			0.041					
N		5 _{regional area}			5 _{regional area}			5 _{regional area}			5 _{regional area}	
Observations		1446			1446			1446			1446	
R ²		.313			.318			.318			.335	

Abbreviations: SES, socioeconomic status; SWB, subjective well-being.

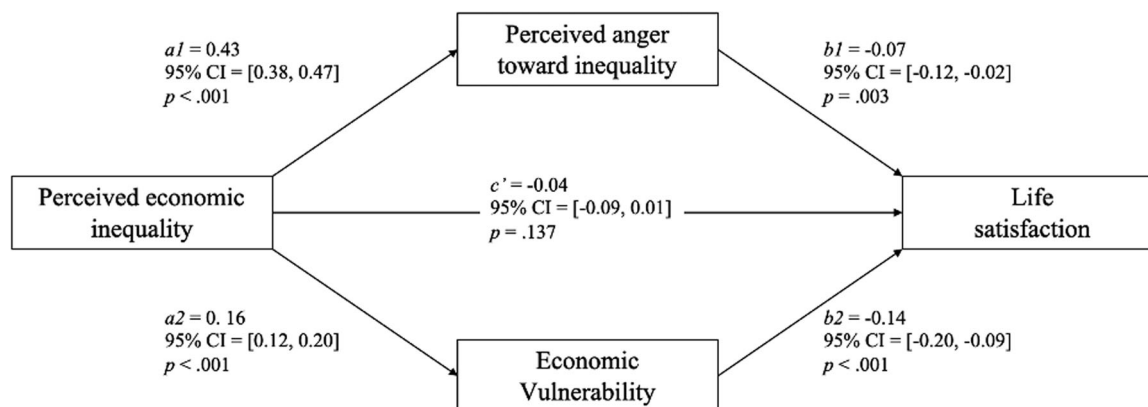


FIGURE 1 Parallel mediation analysis for life satisfaction

5 | DISCUSSION

Although there is a large body of literature on the association between economic inequality and SWB (Wilkinson & Pickett, 2009, 2018), relatively few researchers have investigated the role of such inequality in psychological science. We conducted a cross-sectional study on an Italian representative sample to examine and compare the effects of objective (i.e., Gini index) and subjective (i.e., perceived inequality) indicators of economic inequality on individuals' SWB, both in its affective and cognitive components. The small body of existing research that considered subjective inequality had not examined any psychological mechanisms that might explain the relationship between perceived inequality and SWB. To this end, we tested the mediating effects of anger toward inequality and economic vulnerability.

In general, the objective measure of economic inequality (i.e., regional Gini index) did not show an effect on both the affective (i.e., psychological well-being) and cognitive (i.e., life satisfaction) components of SWB. This result is in line with recent meta-analytical findings (Ngamaba et al., 2018) showing that the aggregate effect of economic inequality, as measured by the Gini index, is nonsignificant and close to zero. Instead, the subjective perception of economic inequality showed a negative impact on both facets of SWB while partialling out the effect of some relevant predictors of SWB. These results favored Hypotheses 1a and 1b, namely, subjective perceptions rather than objective indicators of inequality are better predictors of SWB. These findings may be framed into foundational findings in social psychology according to which people's perceptions of an event (i.e., economic inequality) have a greater effect on individuals' cognitions and behaviors than the objective reality of that event (Lewin, 1939). It should be noted, however, that the multilevel models on the five regional areas showed low levels of ICC in the null model, especially for life satisfaction. We acknowledge that having more variance at the individual than the regional level might favor level-1 predictors (i.e., perceived economic inequality) over level-2 predictors (i.e., Gini index), so we should be cautious about deriving firm conclusions

from the results. However, when testing the regional variance, we should consider that small ICCs at the higher levels are offset by large cluster sizes at these levels (Hox et al., 2017). Thus, by testing multilevel on a larger sample at level-2 (i.e., 20 regions), we provided a better estimation of the effects on SWB. In addition, it should be pointed out that the lack of evidence of the impacts on SWB of specific contextual characteristics does not mean context has no impact at all. In other words, if the ICC is close to zero, it does not necessarily mean that the objective characteristics of a context are not important compared to individuals' factors. Rather, it could be that the boundaries we used to define the groups at the higher level do not correspond with the boundaries that shape the relevant environment for individuals' SWB. Thus, future research might opt for more (psychologically) relevant operationalization of the context (e.g., neighborhood). Furthermore, multilevel analyses showed that the effect of perceived economic inequality does not significantly vary across the actual level of economic inequality in the regional areas. Nevertheless, it is important to note that the absence of this effect might be due again to the low outcome variability at level-2. Even though the analysis conducted on a larger level-2 sample provides a better estimation of model terms, it is difficult to conclusively affirm that the effects of perceived economic inequality on SWB do not vary across different Gini levels. To sum up, although we cannot firmly conclude that the objective level of inequality has no influence on individuals' SWB or that it does not interact with the subjective perception of inequality, we found that the perception of economic inequality and its injustice has an impact on SWB in addition to some of its major predictors (i.e., subjective SES, social support, the personal impacts of COVID-19).

We found that the wage gap estimation measure (i.e., individual Gini) showed no effect on SWB components, supporting our Hypotheses 2a and 2b, and further corroborating the idea that the wage gap estimation measure (Jasso, 2009) may be not an ideal tool for assessing subjective inequality. Aside from Jasso's measure being subject to bias, it does not tap into individuals' experience of the phenomenon and the injustice linked to it. This result seems to suggest that the way we measure how people perceive economic

TABLE 4 Results of the multilevel regressions on affective SWB

Fixed effects	Model 1			Model 2			Model 3			Model 4		
	β	95% CI	p Value	β	95% CI	p Value	β	95% CI	p Value	β	95% CI	p Value
Individual-level variables												
Intercept	0.13	0.05–0.21	<.001	0.13	0.04–0.21	<.001	0.13	0.05–0.21	<.001	0.12	0.04–0.20	<.001
Individual Gini	–0.00	–0.05–0.04	.828	0.01	–0.03–0.05	.636	0.01	–0.03–0.05	.606	0.01	–0.03–0.05	.640
Objective SES	–0.06	–0.10 to –0.01	.011	–0.06	–0.10 to –0.01	.011	–0.06	–0.10 to –0.02	.008	–0.05	–0.10 to –0.01	.014
Subjective SES	0.16	0.11–0.20	<.001	0.15	0.10–0.20	<.001	0.15	0.10–0.19	<.001	0.13	0.09–0.18	<.001
Perceived social support	0.20	0.16–0.25	<.001	0.21	0.16–0.25	<.001	0.21	0.16–0.25	<.001	0.20	0.16–0.24	<.001
COVID-19 personal impact	–0.43	–0.47 to –0.38	<.001	–0.42	–0.47 to –0.38	<.001	–0.42	–0.47 to –0.38	<.001	–0.36	–0.41 to –0.31	<.001
Age	0.16	0.12–0.20	<.001	0.16	0.12–0.21	<.001	0.16	0.12–0.20	<.001	0.14	0.10–0.18	<.001
Gender (female)	–0.26	–0.34 to –0.17	<.001	–0.25	–0.33 to –0.17	<.001	–0.25	–0.33 to –0.17	<.001	–0.22	–0.31 to –0.14	<.001
Gender (other)	–0.56	–1.46–0.35	.229	–0.53	–1.43–0.37	.251	–0.54	–1.44–0.36	.252	–0.45	–1.33–0.43	.320
Perceived economic inequality				–0.06	–0.11 to –0.02	.003	–0.06	–0.14–0.02	.005	0.02	–0.05–0.09	.538
Economic vulnerability										–0.06	–0.12 to –0.01	.014
Anger toward inequality										–0.17	–0.22 to –0.13	<.001
Regional-level variables												
Gini	0.01	–0.19–0.22	.895	0.01	–0.19–0.22	.898	–0.01	–0.15–0.14	.729	–0.01	–0.15–0.14	.944
GDP per capita	0.08	–0.14–0.29	.488	0.07	–0.14–0.29	.492	0.05	–0.10–0.19	.198	0.05	–0.10–0.20	.491
Cross-level interaction												
Perceived economic inequality X Gini							0.02	–0.06–0.09	.581	0.02	–0.05–0.08	.634
Random effects												
σ^2_e		0.795			0.794			0.793			0.818	
σ^2_{u0}		0.065			0.065			0.001			0.012	
σ^2_{u1}								0.105			0.041	
N		5 _{regional area}			5 _{regional area}			5 _{regional area}			5 _{regional area}	
Observations		1446			1446			1446			1446	
R ²		.367			.371			.371			.395	

Abbreviations: SES, socioeconomic status; SWB, subjective well-being.

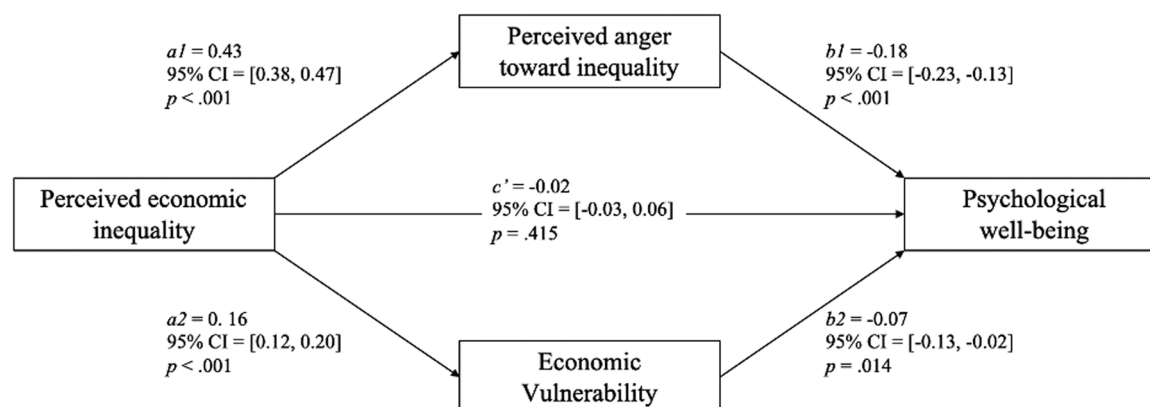


FIGURE 2 Parallel mediation analysis for psychological well-being

Outcome	Effect	β	95% CI	p Value
Life satisfaction	Total effect	-0.09	-0.14--0.04	<.001
	Direct effect	-0.03	-0.08-0.02	.183
	Indirect effect			
	Anger toward inequality	-0.03	-0.05--0.01	.002
Well-being	Indirect effect			
	Economic vulnerability	-0.02	-0.03--0.01	<.001
	Total effect	-0.07	-0.11--0.02	.002
	Direct effect	0.02	-0.02-0.07	.370
	Indirect effect			
	Anger toward inequality	-0.08	-0.10--0.06	<.001
	Economic vulnerability	-0.01	-0.02-0.001	.033

TABLE 5 Results of the mediation analyses

inequality matters and that there might be psychological constructs that are better explained by either facet of perceived inequality.

The resulting associations' patterns for cognitive and affective SWB are comparable to each other: Both are predicted by subjective SES, perceived social support, and the COVID-19 impact on participants' lives. Similarity is likely due to the theoretical relationship between components (Gallagher et al., 2009). However, it is worth noticing that the pandemic impact was greater on the affective than cognitive SWB. Such difference may be due to the temporal framework used to anchor the answers on the dependent variables: The affective measure required participants to evaluate SWB in a period when the pandemic was still a major issue for many (i.e., December 2020), while the cognitive measure required a general evaluation of SWB not associated to a temporal dimension. Thus, it is possible that the affective measure has also substantially captured the impact of COVID-19 on well-being. Nonetheless, our results align with recent literature showing the impact of the pandemic on individual psychological health (Codagnone et al., 2020; Lieberoth et al., 2021).

Interestingly, there are also some factors that predict one facet of SWB and not the other. Objective SES showed an association only with affective SWB. Research has shown that objective SES is robustly associated with health outcomes. Lack of material resources makes it more likely that individuals will be subjected to harsher living

conditions, suboptimal environments, and limited access to quality education, employment, and health (Kraus, 2018). These circumstances can have a negative impact on physical and mental health (Adler & Ostrove, 1999). Past research has evidenced that individuals with low levels of objective SES are more likely to suffer from cardiovascular diseases (Kershaw et al., 2010), depression (D'Souza et al., 2005), and to report lower well-being (Brooks-Gunn et al., 1997). However, many researchers have questioned the adequacy of objective SES to capture variance in SWB as previous observations showed complex (e.g., nonlinear) relationships between material resources and SWB (Diener et al., 2010). This might explain why we did not find an association between objective SES and the cognitive component of SWB. A further point of concern relates to the direction of the association: Although we observed a positive correlation between objective SES and affective SWB, the association was negative in the regression's multivariate context. It is plausible that another variable may confound the effect of objective SES on affective SWB (MacKinnon et al., 2000). We have to bear in mind that data were collected during the COVID-19 pandemic which has caused economic stress and vulnerability across various population strata (Codagnone et al., 2020). It may be that also those who show higher levels of objective SES have experienced such difficulties, which have overturned the well-established positive effect of objective SES on SWB (Navarro-Carrillo et al., 2020).

Regarding the mediation analyses, we found that both perceived anger toward economic inequality and economic vulnerability have negative indirect effects that fully mediated the association between perceived economic inequality and SWB. The more anger and sense of precariousness of existence one perceives, the less well-off and happy people feel. This result suggests that it may not be the perception of economic inequality itself that affects well-being, but individuals' cognitive (i.e., economic vulnerability) and affective (i.e., anger) responses to it. Indeed, it is plausible that a context marked by high inequality may decrease the perceived personal economic control and mastery of individuals' lives. For example, Lachman and Weaver (Lachman & Weaver, 1998) found that low-SES individuals with high levels of perceived control have health outcomes similar to those of high-SES individuals. However, high inequality environments may also diminish optimism and foster hopelessness and hostility, closely linked to anger (Adler & Snibbe, 2003).

It is important to recognize some limitations of our research and the future research questions it generates. First, the correlational design of our study does not allow us to speak about causality confidently. In spite of the improbability that lower levels of SWB lead to an increase in the Gini coefficient, it is certainly possible that people showing lower SWB perceive more inequality due to a grim perspective of the world. Second, our study is limited in its reliance on a representative Italian sample, and we cannot confidently generalize our results to other populations. As economic inequality interacts with an individual's culture to shape the concept of well-being (Buttrick et al., 2017), it would be helpful to test whether the relationship between perceived inequality and well-being holds across different cultures. Further, our study focused on the hedonic facets of well-being. It remains an open question whether the effect of perceived inequality, and the psychological mechanisms that link it with hedonic well-being holds for other theoretical perspectives (e.g., eudemonic and social well-being). In a similar fashion, future research would benefit from examining additional variables related to objective inequality, such as health outcomes, obesity, and violent behavior (e.g., Wilkinson & Pickett, 2009), along with other psychological constructs (e.g., attitudes toward redistribution policies) and behavioral outcomes (e.g., collective actions). Finally, while we found interesting results on the role of anger in linking the appraisal of economic inequality to well-being, we focused our interest on this specific emotional reaction. As the emotional responses to the appraisal of economic inequality vary, for instance, sadness, guilt, but also positive emotions, such as hope (Cohen-Charash & Byrne, 2008; Mikula et al., 1998), further research may focus on these other kinds of emotions. Indeed, the emotional aspects of a good life vary with the values that characterize one's culture. Even though negative and positive emotions might be universally viewed as undesirable and desirable, respectively, there appear to be clear cultural differences in how relevant such emotional experiences, and their nuances, are to the quality of life (Kuppens et al., 2008).

In conclusion, the present research provides initial evidence that the individual perception and experience of economic inequality may

be better predictors of the affective and cognitive components of SWB than its objective measure (i.e., Gini index). Although further research is needed to better understand the role of objective measures of inequality (e.g., Gini index, but also other formulation, such as the Theil or ratio indices) on SWB, finding that the subjective experience of inequality has an effect on SWB is relevant both theoretically and empirically. Theoretically, it means that objective facts, such as inequality, have psychological relevance when they have subjective meaning. Thus, since subjective inequality exists at the individual level, it lends itself to studies of its psychology (Schmalor & Heine, 2021). Empirically, future investigations on the effects of economic inequality on individuals' perceptions, cognitions, and behaviors should consider this construct.

AUTHOR CONTRIBUTIONS

Conception and design: Michela Vezzoli, Roberta Rosa Valtorta, Silvia Mari, Federica Durante, and Chiara Volpato. *Data collection:* Michela Vezzoli, Roberta Rosa Valtorta, Silvia Mari, and Chiara Volpato. *Data analysis and interpretation:* Michela Vezzoli, Roberta Rosa Valtorta, and Silvia Mari. *Manuscript drafting and revising:* Michela Vezzoli and Silvia Mari. *Approval of final version for submission:* Michela Vezzoli, Roberta Rosa Valtorta, Silvia Mari, Federica Durante, and Chiara Volpato.

ACKNOWLEDGMENTS

This work was supported by the Italian Ministry of Education, Universities and Research (<http://www.miur.gov.it/>) grant to the authors (PRIN, 2017, 2017924L2B). The funder had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript. Open Access Funding provided by Università degli Studi di Milano-Bicocca within the CRUI-CARE Agreement.

CONFLICT OF INTEREST

The authors declare no conflict of interest.

DATA AVAILABILITY STATEMENT

The data that support the findings will be available on OSF at <https://osf.io/r76ew/> following an embargo from the date of publication to allow for commercialization of research findings. The data that support the findings of this study are currently available on Editor and Reviewers request from the corresponding author. The data will be publicly available on OSF following the end of the research project.

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How to cite this article: Vezzoli, M., Valtorta, R. R., Mari, S., Durante, F., & Volpato, C. (2022). Effects of objective and subjective indicators of economic inequality on subjective well-being: Underlying mechanisms. *Journal of Applied Social Psychology*, 1–16. <https://doi.org/10.1111/jasp.12928>